IN THIS ISSUE: Putting Over an Electrical Home Campaign

JOURNAL OF ELECTRICITY

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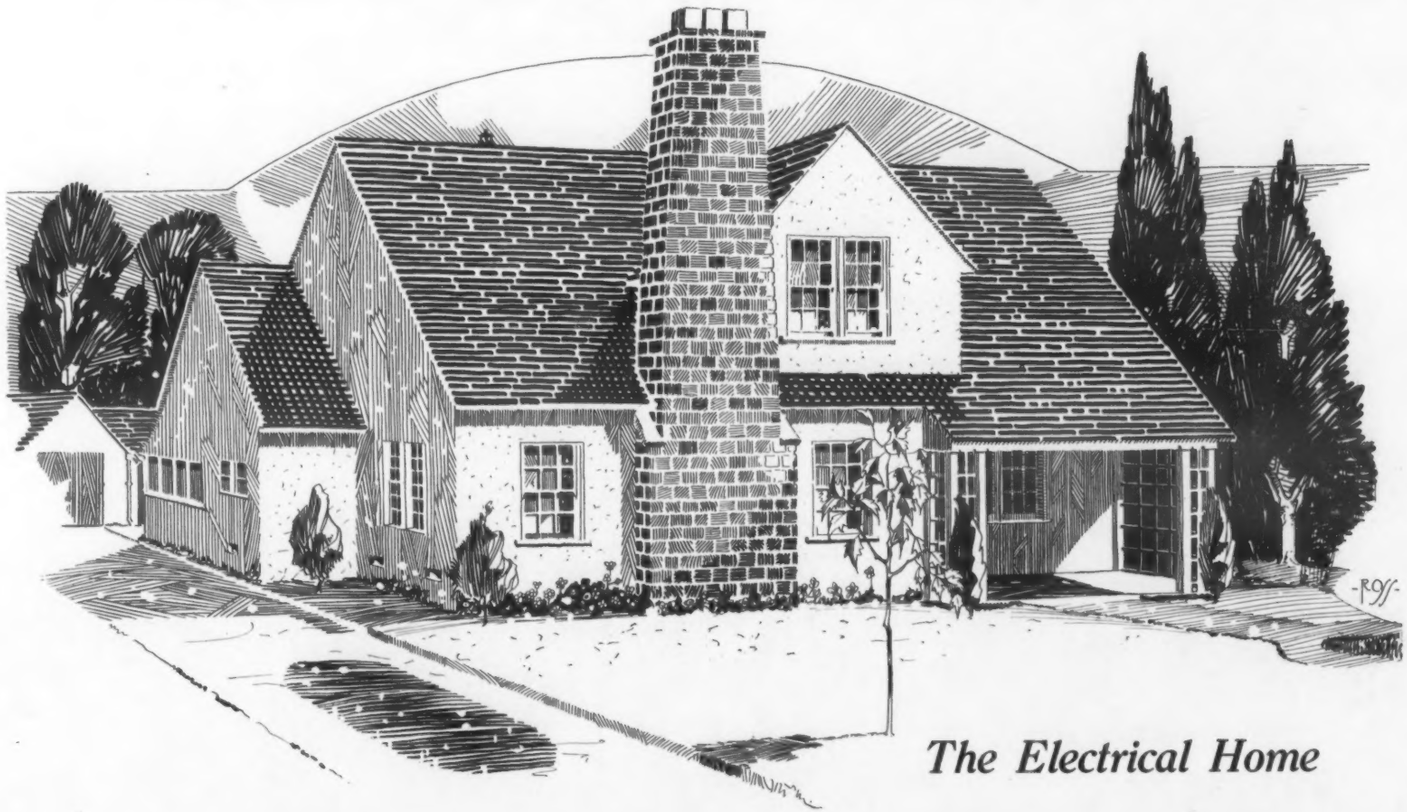

The Electrical Home

With an estimated sale of two billion dollars' worth of electric appliances in 1920, the prophecy is made that the household use of electricity will prove the most promising field for development open to the electrical industry. In its educational value and concrete results, the Electrical Home movement, the latest contribution of the West, is perhaps the most significant step taken by the electrical industry in recent months. It is estimated that the Electrical Home at Sacramento, California, shown above, will be visited by over 10,000 people—and this is only one of a series of twelve or fifteen such demonstrations which are being staged by the electrical men and real estate firms of California.

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JOURNAL OF ELECTRICITY

DEVOTED TO THE UPBUILDING OF THE ELECTRICAL INDUSTRY IN THE WEST AND IN THE COUNTRIES BORDERING THE GREAT PACIFIC

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SOMETHING TO THINK ABOUT

ALMOST astonishing prospect is opened by the applications recently filed by the city of Los Angeles with the California State Water Commission covering practically all the water power remaining available in the southern portion of the state. This commences with the watershed of the Tuolumne River and includes almost everything pictured on Geological Survey maps from there southward, among the list such items as Illilouette Falls in Yosemite Valley, the Tuolumne River above the Grand Canyon, Thousand Island Lake below Mt. Ritter and other scenic beauties which it will be a surprise to many to learn are considered as open for power development. Something like a million horsepower are involved in the applications.

Aside from the protest which special features of the scheme will undoubtedly call forth from the Sierra Club and from others who have enjoyed these portions of the Sierras, a contemplation of the possibilities involved in the scheme as a whole is even more astonishing. It may be, of course, that Los Angeles is not intending actual development of all these projects, but merely establishing priorities until such time as it can determine what it wishes to do; it may be that the Water Commission will not grant the application; it may be that Los Angeles could not put through a bond issue which would finance such an undertaking (it is obvious that some $300,000,000 would be needed to put this power on the market), but all these matters are beyond the point.

The question of major importance is whether a municipality shall now or at any later time be allowed to go into the power business outside of its own territory on a purely commercial basis. It is plain that Los Angeles cannot intend this 900,000 hp. solely for its own use. As a matter of fact, it is already in possession of power rights on the Owens River on which it has not pressed development. On the other hand, the major portion of the San Joaquin Valley and all of the southern portion of the state is dependent for its ultimate development upon just these water powers for which Los Angeles is making application. The resulting picture is one in which Los Angeles furnishes the power to all the lower half of California, either directly or by wholesaling it to the power companies, and in which this district is dependent upon the voters of that city for the bond issues, the city government and the engineering management which shall determine the valley's development. In such a case, it is conceivable that San Francisco might take a similar step in northern California and Portland and Seattle follow suit farther north, which would place the development of this coast in the hands of its large cities. Is the West prepared to entrust itself to this directorship?

200,000 Electrically Educated

It is estimated that two hundred thousand people will visit Electrical Homes in California by the first of the year, and that all of $14,000 will be spent in advertising the campaign through the newspapers, two-thirds of it by real estate firms. What is more, this money has not been donated in charity nor in the interests of a sister industry, but from the only sound motive for spending money in business, that of self-interest.

These figures are impressive as showing two concrete results of the electrical home movement. Perhaps even more significant in indicating the success of the campaign is the announcement by one of the real estate firms involved that it is to adopt the permanent policy of building electrical homes. In other words, the returns from this campaign are to be cumulative in effect—it is a movement started, rather than a campaign for its day alone. It matters little whether these homes contain all the details in extensive wiring of the original; the point is that the electrical home idea is developing on its own merits without any subsidy from the electrical industry, simply by virtue of its commercial value.

Equally important is the report of two private homes which are being erected in Chico, the wiring of each of which is to cost more than $1,000. In Oakland, one firm is putting in 150 homes, all of them wired for electric ranges. With the home builder, both individual and commercial, interested to the point of actually putting the lesson into practice, the Electrical Home Campaign appears to be a success.

California's Combination Code

The uniting of the National Electric Code, which is commonly known as the Fire Code, with the Electrical Utilization Safety Orders is the gigantic task being attempted by the California Industrial Accident Commission, with the help of a committee which represents all branches of the electrical industry. This movement should be backed by all the members of the industry as it will lead to an easier interpretation of the two codes which at present are extremely vague. A new form should be

adopted which will permit the grouping of all rules relating to a specific subject under the title of that subject, and the subject titles should relate to the classification of the installation. In other words, if a contractor was working on condulet he could look up that subject in the index and find all of the rules regarding the installation of condulet in one group.

The recommendations contained in the provisions of the Fire Code should be made mandatory by the Industrial Accident Commission, and the combination of the two codes should be revised as often as the National Electric Code is revised in order that the people of the state of California may have the maximum protection. In order to eliminate the cost of duplicate inspections by the state it has been suggested that the proposed code directly recognize the labels issued by the Underwriters' Laboratories, both fire and accident. It is folly to suppose that the people of California would allow the Accident Commission to set up such an expensive thing as a complete testing laboratory, which would be a considerable drain on the state treasury, when complete tests that have always been satisfactory are being made by the Underwriters' Laboratories.

If the ideas expressed above are carried out in the combining of the two codes it should not only prove of value to the different branches of the electrical industry in the simplifying of their work, but of great value to the people of the state of California, assuring them of a double check on the methods used in the wiring of industrial and manufacturing plants. If such a bill will make the work of the Industrial Accident Commission easier or more efficient in cutting down the loss of life and property from electrical causes, it is to the best interests of the industry to support it. The more the general public realize that the electrical industry is producing absolutely fool-proof and safety first appliances, and is doing all that it can to safeguard life and property, the greater will be the general acceptance of electrical appliances, and the abolition of the fear that most people have of things electrical.

Education and the Electrical Home

According to an ancient proverb, you can "lead a horse to the water but you cannot make him drink." The spirit of the remark can equally well be applied to a woman—some women—and electrical labor-saving devices. A few women do not use electrical appliances because they cannot afford them, but a far greater number ignore them because they were not brought up to use them, and their mothers "got along very well without." This adherence to what one has been used to, however, works both ways, and will be an important factor in perpetuating the work accomplished by the house management course described on another page of this issue.

In this course the student is transported to a model home where electric appliances are taken for granted. Here she not only uses electricity continually but learns also to execute minor repairs, thus getting beyond that "mystery" with which so many women invest everything electrical.

In the definite linking up of electricity with domestic training lies a great opportunity both for the electrical industry and for the educational institutions. Cooperation between the two will accomplish much for the promotion of the electrical home idea, and for the betterment of the conditions of daily living in the community.

It is difficult to overestimate the value of this kind of training, and its future possibilities. There are today about 470 universities and colleges in the United States, and something over 12,000 public high schools, to say nothing of innumerable other educational institutions, public and private, of all kinds. Great numbers of these conduct domestic science departments, but comparatively few have introduced electrical household appliances into the work of these departments. In the active promotion of the idea lies one of the greatest opportunities to turn to good account that innate conservatism which clings to the tools to which it has been accustomed, and to make the electrical appliance indispensable to the housewife of the future.

The Contractor and the Electrical Home

Not the least of the advantages of the Electrical Home plan is the opportunity which it offers to the electrical contractor to formulate ideas on good practice in house wiring. The very speed with which the electrical industry has grown has left the contracting branch of the industry little time to devote to keeping up with the latest theories, and part of the poor house wiring which has been done in the past has undoubtedly been due as much to the fact that the contractor did not suggest better, as that the householder or the architect could not be sold the idea.

The electrical homes, as wired, are not intended as models of every new device on the market, and undoubtedly they could be bettered in detail by those who have studied out special features of especial convenience, but they do represent houses modernly wired along well thought out lines. The campaign is one of education—and the electrical industry may benefit as well as the public.

Electrical Engineers' Convention

One of the principal points brought out in the discussion during the recent Pacific Coast Convention of the American Institute of Electrical Engineers at Portland, Oregon, was that the engineers of the power companies do not and have not received equal consideration in their affiliation with the Institute as have others in their organizations such as the commercial men received in connection with their affiliation with organizations such as the National Electric Light Association. This is in no way to the discredit of either the companies, the commercial men or the attitude of the companies toward the National Electric Light Association. It

is eminently proper that the greatest encouragement be given to the vital work of the N. E. L. A., but it is equally important that the greatest consideration be given to the Institute, as it is an association of greater value to the engineers than is the N. E. L. A.

An engineer's most valuable education and training is received after he has left college, and entered practical work. Either through habit or necessity. an engineer is somewhat of a recluse, and he is too often given to being backward in his demands for those things justly due him.

It therefore behooves the engineer to insist that the greatest consideration be given him in the affiliation he has with engineering societies, and the companies should recognize the necessity of their engineers taking every opportunity to meet with their fellows and gain the experiences of them all.

The Increase in Freight Rates

The recent increase in freight rates of 33 1/3% which will become effective on the Pacific Coast August 20, will have a direct effect on the electrical industry, increasing the cost of materials as it does. It will increase the cost of all materials which the Pacific Coast states have to import from the East, and while it will no doubt retard the building industry it should have the effect of stimulating manufacture. With the promise of plenty of power for next year there is no doubt that eastern manufacturers will be forced to establish western branch factories if they are to hold the trade of this section of the country. Whether this condition of high freight rates is to continue or not makes little difference providing that the people of the West see this opportunity to foster home industries and make the West independent of eastern manufacturers, car shortages, and still higher freight rates. To the electrical industry it means an opportunity to build up a large, desirable industrial load, proving that it is indeed "an ill wind that blows nobody good."

Distribution of Rewards

The almost unanimous demand by public utilities for increased rates has concentrated attention as never before upon the function of the public utility, its relation to the community, the methods and extent of its service, and the organization and distribution of its finances. The public is being brought to see by every possible means that improvements and extensions are essential if a utility is to keep pace with the demands made upon it, and that in the last analysis financial disability is reflected in inadequate service to the consumer. Conversely, it is apparent that in return for the higher rates the consumer tends to expect better service, and the question arises as to how the power company can meet this expectation in such a way as to create steadily increasing confidence and good feeling.

It has been maintained that increased rates allowed to power companies should bear some relation to the individual company's efficiency, and to the degree of its service to the public. This principle is based on a recognition of the stimulating effect of the reward for efficiency, and virtually pledges the company so to distribute the reward that it really has this stimulating effect. A power company is a complex organization, and a large number of factors contribute to the quality of its service. The relative value of these is a matter for individual decision, but the general principle of equitable distribution of reward among employes must necessarily play a large part in maintaining efficiency, and in building up the type of service the public has been taught to expect.

The personnel of a public utility is fundamentally the most important medium through which service is rendered. It is therefore a matter of self-interest for the company to consider from this point of view the allocation of its funds subsequent to an increase in rates, always aiming to apply them at the points where they will have the greatest stimulative effect, and will best meet the public expectation of constantly improving service.

Building Activity as an Electrical Opportunity

Typical of the business situation in the West are the building records of Los Angeles and San Francisco for the first half of the present year. From January 1st to June 30th there were issued in Los Angeles 11,634 permits, valued at $29,318,689—an amount greater than for the entire year of 1919. Of this some $12,000,000 was expended on industrial plants. In San Francisco there has been launched since the first of the year industrial construction calling for an expenditure of $5,208,300 for building alone, exclusive of equipment. These figures, while they obviously indicate a building boom, have a significance far beyond their immediate application.

No indication of general business activity is of greater interest and importance to the electrical industry, both directly and indirectly, than this phenomenal building program. Figures show that 142 industrial firms and corporations have opened up new establishments in San Francisco, or increased the size and capacity of existing plants, in the last six months, and in these days every new industrial plant means extensive electric wiring and lighting, and complete or partial electrical equipment for operation.

Figures for residence building also show a marked and rapid increase since the beginning of the year, and indicate an unlimited field for wiring, for the sale of lamps and appliances, and for increased power service. It is always among the builders of new homes, where there is no question of the inconvenience of re-wiring, that the doctrine of the electrical home will have its strongest appeal, and the present building activity is furnishing a unique opportunity for the establishment between architects, builders and the electrical industry, of the cooperation which has lately been the subject of so much discussion.

In addition to industrial and residential construction, building permits show large numbers of office buildings and theatres under way, all of the most modern type and demanding exceptional and often elaborate illumination systems.

Figures from New York reveal a decrease in building activities, owing to the high price of labor and materials. In the West these obstacles seem to have been powerless to hamper the overwhelming activity. The general situation is doubly important as showing the increasing attraction which the Pacific Coast has for eastern capital, and provides a most optimistic outlook for the electrical industry west of the Rockies, where so much large-scale electrical development is already planned for the next ten years.

Outlook for Business Conditions

In spite of minor depressions, business men look upon present conditions with some optimism. There is no question but what the consumer demand in many lines has lessened of recent months, particularly in the field of household devices and wiring material, largely as a result of the delayed building activities in the country as a whole. On the other hand, there are no surplus stocks of these materials on hand and the slack period allows production to catch up with demand. The restricted credit situation is looked to to clear up by fall. Labor conditions seem to have turned the corner for the better. Although transportation conditions are bad, railway equipment companies are busy, which would indicate that September will see new rolling stock available. The presidential election seems to have little effect on business one way or the other.

At the present time, perhaps the most cheerful aspect of the situation is the fact that the public is coming to realize that the price cutting sales of early summer were not part of a permanent price reduction movement. It is being recognized that there can be no sudden drastic reduction in prices, but only as production conditions make lower levels possible. While abnormal profits have been made along some lines, in the aggregate prices have borne a direct relationship to the cost of materials and labor, the realization of which fact is tending to steady the public's buying.

In general, while the present conditions are far from good, business looks forward to a more optimistic tone in the fall with a revival of buying along all lines dependent on demand by the general public.

The Cooperative Campaign Idea Spreads

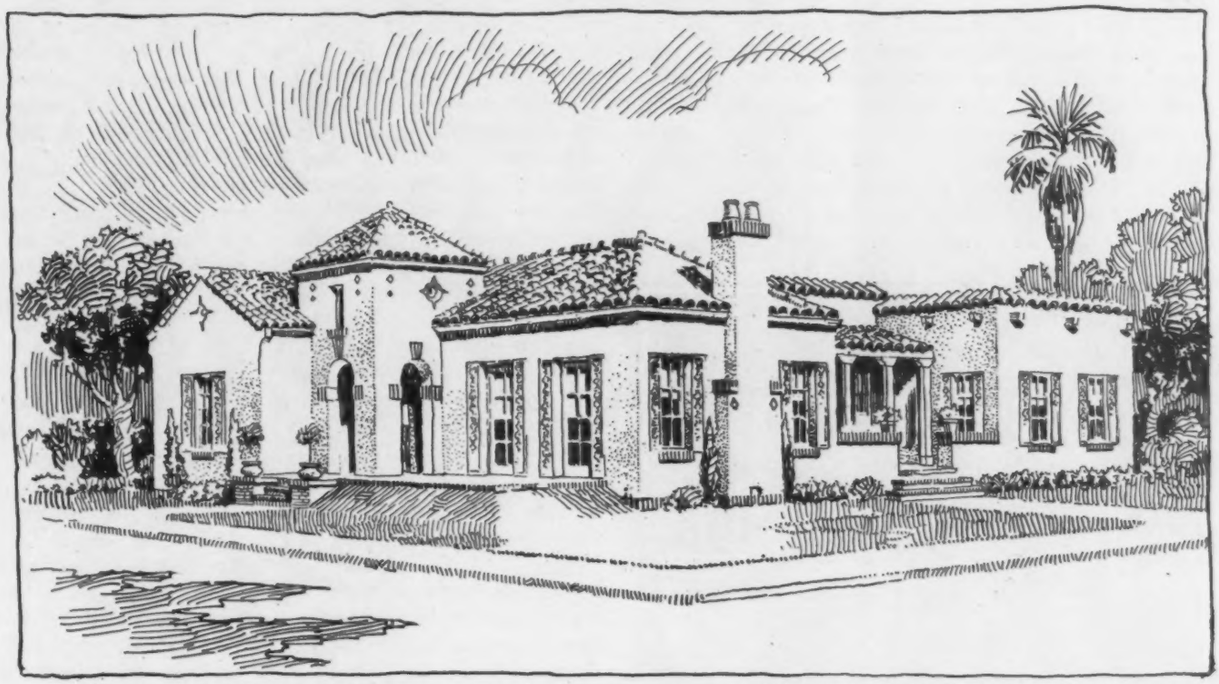
Extensive plans are under way in British Columbia for the inauguration of an electrical cooperative campaign movement, the recent reorganization of contractor-dealers in Salt Lake in which Inter-mountain jobbers are participating as well, is undertaking work in a true cooperative spirit, the Northwest is already making preparations for the formulation of such a campaign —in fact, it will not be long until all parts of the West will be covered by such organizations. The importance of this step in the improvement of merchandising methods and inter-industry conditions through all this region can best be measured by the success of the California movement, upon whose model most of these movements are based. The record is one of new stores opened and old ones improved, of old enmities wiped out, of constructive ideas put into practice. The West already stands high in the standards of its merchandising and the present campaigns of improvement outlined promise well for an even brighter future.

MONEY may be "the root of all evil," but it has other functions — for instance, the development of hydroelectric energy. The vital question of

Financing Power Developments

will be discussed in its several aspects in the September 1st issue of the Journal of Electricity. There will be additional features on

Progress in Hydroelectric Construction
The Cooperative Movement in the Northwest
The Convention of the Northwest Electric Light & Power Association



A residence of particular beauty is being built in Los Angeles to serve as a Home Electrical. With the interest already being shown in this project, together with the others being planned throughout the state, it is expected that 200,000 people will have visited Electrical Homes by the first of the year. E. B. Rust is the architect.

How to Put on an Electrical Home Campaign

(The success of the electrical home campaign has been largely due to the manner in which the undertaking has been handled. Several cities in California now have their demonstration electrical homes, and the following article outlines the workings and the results of these campaigns as carried on in California.—The Editor.)

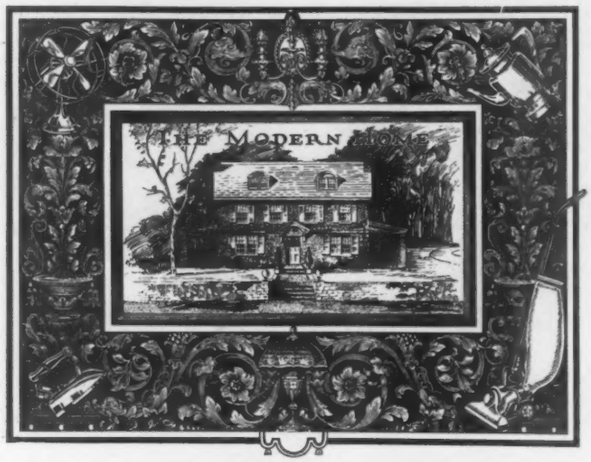
The success of the Electrical Home which was featured in San Francisco during the latter part of June has definitely established the value of this idea as an advertising medium and has opened up a new field for the telling of the electrical story. The Electrical Home as here carried out was an attractive new residence in St. Francis Wood, which, with the cooperation of the Mason-McDuffie real estate firm and the electrical industry of the community, was wired in the most approved method to illustrate the value of the convenience outlet. In order fully to advertise this idea and to bring home to the public the unique convenience of electricity, an electrical exposition was staged in the new residence during the first three weeks, electrical apparatus and fixtures being donated for the occasion by electrical jobbers and manufacturers. An extensive advertising campaign announced the event, with such success that some 18,000 people visited the home during the time that it was open and many more who did not find the time to attend became acquainted with the electrical idea as an attractive and modern convenience, an essential to the most up-to-date comfort.

Model Electrical Homes

With the success of this initial experiment as an argument, the California Electrical Cooperative Campaign representative, in cooperation with the electrical industry in other parts of the state, has succeeded in arranging for the establishment of similar demonstrations in several other cities. The J. C. Carly Company of Sacramento is devoting one of the most artistic of the new homes in its residence tract for this purpose, an electrical home is to be opened August fifteenth in the Lakeshore district of Oakland under the auspices of the W. H. Leimert Company, a Los Angeles home is under construction by the Wiley Edwards Company to be opened October first and similar homes are planned later in the season for Fresno, Bakersfield, Long Beach, San Diego and Berkeley, not to mention the other communities who will be interested but who have not yet been approached on the subject.

It is estimated that 200,000 people in the state of California will have visited electrical homes by the first of the year. This estimate is based upon the attendance at the San Francisco home and the interest which has been shown elsewhere where the projects are proposed. It is also estimated that $14,000 will be spent directly in the newspaper advertising of these homes in the same period, two-thirds of which or over $9,000 will be spent by the real estate firms carrying out the projects. This does not take account of the extensive publicity which is carried on by power companies and contractor-dealers of the community over their own names, nor the generous advertising with which the real estate firm follows up the electrical idea after the official close of the campaign. When it is realized

that these campaigns have been staged at the strategic advertising points of the state, whose newspapers are distributed over wide areas outside of the local communities, the wide-reaching nature of this movement becomes apparent. The San Francisco papers cover the entire northern portion of California, as the Los Angeles papers cover the south. Similarly the papers from Sacramento, Fresno, and San Diego—in fact, all of the cities selected, have a wide



Booklets on the possibilities of electricity in the home are issued by the Society for Electrical Development and other organizations and are to be had for the asking or at cost. This attractive pamphlet is prepared by the N. E. L. A. and could be used to good effect in supplementing the advertising of Electric Home Week.

area of distribution, so that the entire state of California will be told the electrical story at least twice during the campaign.

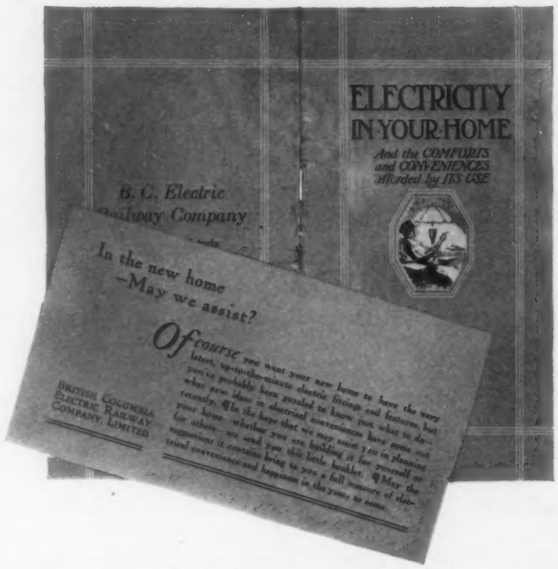
The electrical home idea from the standpoint of the electrical industry, of course, is a method of spreading the gospel of the convenience outlet. No one, least of all the architect and the public itself, questions that the ideal home would contain all electrical appliances available and that such a house in building would represent the last word in wiring. The trouble is that no one ever has quite enough money to build an ideal home and the problem becomes one of selection between tiled bathrooms, hand-wrought door fixtures, patent furnaces and electrical conveniences. The lesson which must be taught is that it is not the model home so much as the average home which should contain these labor-saving devices and that only by proper and adequate wiring can the average home be comfortable in any modern sense. The electrical industry must sell the electrical idea to the public as the idea of open plumbing has been sold, so that the house which is inadequately wired will be as old-fashioned and as difficult of sale or rent as the house without a bathroom. It is obvious that the concrete embodiment of electrical convenience in a house actually for sale and featured as something especially desirable is the most effective argument that could be devised.

Appointing a Publicity Committee

Once the idea has been sold to the real estate firm, the problem becomes one of securing the best representation that can be secured of what electricity can mean in comfort. It is, of course, the place of the electrical industry of the community to make plans for the best presentation of this story. This is usually placed in the hands of a committee of electrical men, either from the electrical club of the community, such as the San Francisco Electrical Development League, or from the local Contractor-Dealers Association. The advantage of having the responsibility in the hands of the contractors is, of course, that the very ones who are to be involved in the later wiring of electrical homes which may result from this movement are associated with it from the beginning and get the value of its educational features, as well as receiving the definite publicity which connection with this movement brings in the eyes of the public.

The committee consists of a main group which supervises the entire plan, with sub-committees on finance, publicity, wiring inspection and house arrangement. The duties of most of these are to be judged from their titles. The committee on wiring inspection is responsible for seeing that the house represents the last word in electrical installation, the committee on finance secures promise of donations from all branches of the electrical industry to cover the expenses involved, while the publicity committee is responsible, not only for the newspaper and other advertising which it put out, but also for the publicity stories which are secured in the daily press.

The house arrangements committee has two distinct functions, the securing and installation of appliances and the actual running of the home. This latter function has been variously managed in the



The importance of home appliances as load builders has been appreciated by the British Columbia Electric Railway Company, Ltd., who send out a little pamphlet and announcement to prospective home builders.

different communities, but in general means that one man has charge of the house during the entire period and that under him, one man is assigned to each room so that there will always be someone to answer questions and to tell the story of the convenience outlet. Probably best results can be secured by having these

men serve for fairly long periods, so that too many people need not be broken in to tell the story. This means that the services of these men are donated by their respective companies, but the investment is a good one in the concrete returns which it promises as well as in the benefit to the man himself. In Sacramento this is so keenly felt by the contractors who are handling the movement that men are to be assigned regularly by the different contractor-dealer establishments in town to take charge of demonstrating the house during the day, and at night the dealers themselves are to be present to meet visitors. Each man will wear a card, bearing his name. It is obvious that the publicity thus gained and the personal contact with just those people who are most interested in electrical ware, will have its later value.

INVESTORS ARE KEEPING KEEN EYES ON REALTY MARKET
SALES SHOW INTEREST IN ALL SECTIONS
OF PROVEN POPULARITY
LOAN OFFERED HOME BUILDERS
ELECTRIC HOME PLAN SPREADS
AUTO DEALERS BUY CORNER SITE
50-50
GEARY AND POLA CORNER IS SOLD
BRIDGE ACROSS BAY MADE ISSUE
Homes Electrical St Francis Wood
Buying a Home on the "American Plan"
WESTWOOD PARK
FOR SALE AT A SACRIFICE
STORE TO LEASE
MASON-McDUFFIE COMPANY

The announcement which appeared in the papers following the campaign, that the Mason-McDuffie Company will hereafter make all their homes "Electrical Homes," is one of the most significant results of the San Francisco experiment.

Appliances in Use

The electrical exposition as a means of bringing people to view the home has justified itself in the results which it has secured. Of course no mention is made of the particular makes of appliances displayed, which will probably be chosen by lot so that no question of favoritism can be involved. In the San Francisco home the various equipment was demonstrated, laundry continually going on in the wash room, meals being cooked in the kitchen and on special occasions, tea served in the breakfast room. The experience of this experiment has shown, however, that it would probably be wiser not to demonstrate the equipment but to focus emphasis on the convenience of connection and to let the mere presence of the appliances tell its own story of electrical comfort possible. Pamphlets featuring the convenience outlet idea will be at hand for those who wish to pick them up and neatly lettered cards above each appliance will give the cost of its operation in terms of local rates. The equipment will be fully connected, of course, so that it may be set in operation at any time for those who inquire.

Methods of Advertising

The costs of advertising are shared by the real estate firm and the electrical interests of the community, in the ratio of two dollars spent by the real estate firm for newspaper advertising to every one by the electrical industry. In addition bill-boards in prominent locations tell the story of the Electrical Home, it is proclaimed by colorful street car cards and window cards set up in every available window. In addition to this, considerable direct-by-mail circularizing is carried out, this taking the form generally of invitations to visit the home. These are extended to members of clubs and classes, as well as to individuals looked upon as prospects, either by the real estate firm or the electrical concerns of the city. A most important branch of this circularizing is the invitation sent out by the power company to its subscribers. Not only are these the people in the city most interested in advertising, but the circular, arriving in the usual envelope of the power company, is sure of attention.

In Sacramento a special feature is to be made of the opening day, the Governor of the state officiating at the ceremony, which is to be attended by the city executive and other prominent officials. Throughout the demonstration, cars running to this district will bear signs proclaiming the fact that they run direct to the "Electrical Home." Similar advertising campaigns will be carried on in each of the cities contemplating such a demonstration.

Mutual Benefits

The Electrical Home costs both time and money on the part of both parties concerned, but the returns promise full recompense for both. The real estate firm has found an excellent advertising medium—a means of attracting 18,000 people to its residence tract in a dignified way. A buried treasure in one of its vacant lots would undoubtedly secure a crowd—but its name would thereby be connected with the bizarre, rather than the progressive, as with this arrangement, and the people attracted would not be those who are interested in home building or purchase. To be sure, all those who attended the home electrical were not prospective purchasers, but surely few persons in San Francisco who planned the building of a home of any consequence in the near future failed to take advantage of this opportunity to see just how wiring should be done.

From the standpoint of the electrical industry, the story of the convenience outlet has been told in the most effective way. The idea of the electrical home as the next new development in modern living conditions has been presented by the foremost realty concern of the community in a manner which shows that they believe it to be a commercial possibility. The idea has been sold, not only to individual members of the community who will be putting in more extensive wiring in homes of their own, and to rival real estate firms who cannot afford to put inferior houses on the market and who must in some measure

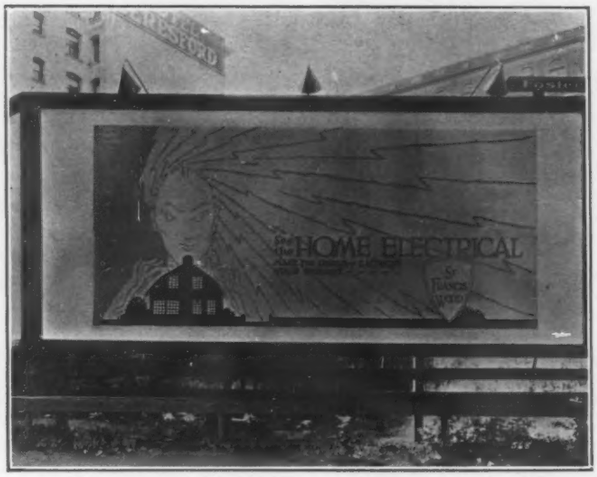
follow the new idea, but the idea will be sold to the real estate firm itself. The announcement by the Mason-McDuffie Company that hereafter all residences built in St. Francis Wood will be electrical homes, is perhaps the most significant result of the experiment in San Francisco. It places the "Electrical Home" in the place where the electrical industry desires it—not a model to be looked upon as an unattainable ideal, but a working thing, so practical and desirable that it is being carried out—and sold—by an important concern to people who are discriminating.

Advertising the Electrical Home

BY H. C. HOPKINS

(An idea, like a product, must be advertised, and advertised not spasmodically but continuously and consistently. The comprehensive campaign carried on to advertise San Francisco's Electrical Home is here described by the chairman of the Publicity Committee of the San Francisco Electrical Development League.—The Editor.)

The publicity campaign for the San Francisco Electrical Home, handled by the San Francisco Electrical Development League, consisted of newspaper advertising, billboard advertising, window cards, street car cards, special folders and special invitations.



Billboard advertising is one of the most conspicuous types of publicity, and conveys a brief but forceful message to the hurrying and unobservant crowds.

Newspaper advertising was carried in all six San Francisco newspapers, three morning and three evening dailies. Seven pieces of copy beginning with a 48-inch ad, continuing with a 30-inch ad and closing with a 24-inch ad.

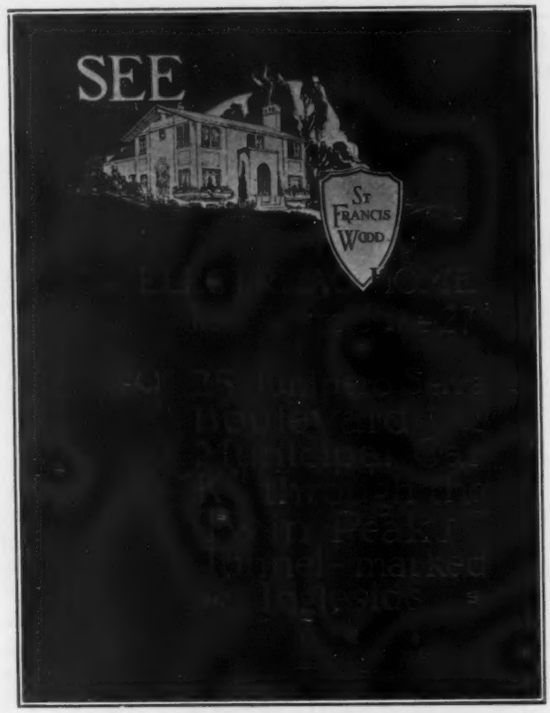
The total number of inches of advertising in all papers was 796 column inches. While the advertising did not begin until June 11th, the opening day, considerable local interest was aroused and 83½ inches of news copy appeared in the San Francisco papers under dates of June 9th and 10th, so that the public interest had been aroused to quite some extent before the newspaper advertising appeared.

To catch the eye of the public, billboards were used, and a special design drawn up to convey the message appeared on eight downtown locations. This billboard advertising appeared a week before the newspaper copy made its appearance, and street car cards were run in all San Francisco street cars one week before the campaign started.

In addition to this a special window card was designed and 500 cards distributed to business houses of all classifications in the city and all merchants cooperated in displaying the card in their windows.

A special invitation was designed and sent to civic organizations, such as business men's organizations and prominent ladies' clubs and societies, and a three-color Electrical Home folder was run off for distribution to visitors at the Home. The design of the folder tied in with the billboard advertising and all other copy, carrying in addition to the cut of the Home, actual floor plans which showed the location of all electrical outlets including lighting.

The Electrical Home opened on June 11th for two weeks, the formal opening address being made by Mr. John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company, to a gathering of over 200 visitors who had been specially invited to attend. The visitors consisted largely of city officials and electrical men. The opening address was responded to by city Supervisors W. S. Scott, chairman of the Building Committee, and Edward I. Wolfe, chairman of the Public Utilities Committee, all of the city government of San Francisco.



A bright card displayed in the windows of all electrical dealers caught the attention of those people most likely to be interested.

By consistent advertising, in all the San Francisco dailies, the publicity committee for the Electrical Home impressed upon the community's consciousness the idea that was being put forward. Only constant repetition in the most widely circulated mediums can achieve the desired effect.

Each day was given over to one of the city's clubs or organizations as well as the general public. The idea of the Publicity Committee in arranging for the reception of clubs or organizations on specific dates was principally to create interest among the very best people in the city, and also to create news so that the Home would be given a fair share of news mention in the newspapers. This worked admirably, as shown by the fact that during the two weeks the Home was opened to the public, it received a total of 430¼ inches of news copy, some mention of the Electrical Home being made in all editions of all the papers from the time the Home opened until it closed officially on June 27th.

All electrical dealers and contractors tied in local newspaper advertising with the Electrical Home; in addition the Pacific Gas & Electric Company devoted their newspaper advertising space to the Electrical Home idea, cooperating to the fullest extent in every way.

The result of this comprehensive publicity campaign was to fill the Home with visitors every day

Samples of the attractive colored folders used to advertise the Electrical Home. The upper one was used for the Sacramento home, the lower one for the San Francisco home.

to such an extent that the work of properly demonstrating and explaining the modern features of the Home was somewhat hampered. So popular did this become that during the two weeks it was open officially, over 18,000 people visited the premises.

It has been amply demonstrated that the general public is ready for all the information which can be conveyed to them on the advantages of properly wiring the homes and the proper and efficient use of appliances. The campaign has been further responsible for a new outlook among architects and builders, who are beginning to realize the advantages to be gained by wiring homes in anticipation of the awakening which is sure to come.

As one swallow will not make a summer, so one Electrical Home will not put across this big idea. It must be followed by other Electrical Homes on a larger and better scale than this one and the idea must be copied and followed in every city. It is the cheapest form of advertising for the general education of the public, and can only result in advancing the interest of the electrical industry by showing people the numerous devices properly applied that have been developed, for increasing home convenience and reducing home labor.

ELECTRIC LIGHTS AND EGG PRODUCTION

Some very interesting experiments have been performed by Prof. W. E. Schoppe, poultry expert of the Montana state experimental farm, along the line of increasing egg production by the use of electric lights in the chicken coops. Two flocks of hens of the same variety were put into separate pens and given the same treatment and feed except that in one of the coops electric lights were placed that were lit from 6 a.m. until dawn and from dusk until 9 p.m. It was found that the hens in the lighted pen needed more feed than those in the other pen but this extra cost was charged against them. During the month of November the unlighted pen showed a loss of 4½c. per bird while the lighted pen showed a profit of 24c. per bird, and in December the unlighted pen showed a profit of 11.5c. per bird with the lighted pen showing a profit of 59.2c. per bird.

The test was continued for a period of ten months and during that time the profit from the birds in the unlighted pen was $473.80, while the birds that had been kept in the electrically lighted pen showed a profit of $568.19. It should be noted that the record speaks of profit and not production, and shows that the hens in the lighted pen produced a higher profit after making full allowance for the extra feed and for the cost of the lights.

The Architect's Viewpoint

BY HENRY H. GUTTERSON

(Without open discussion no good work can proceed, and it is essential in the promotion of the electrical home idea, which needs the cooperation of several industries, that the viewpoints of all concerned should be brought forward. The author of the following article was architect for the San Francisco electrical home at St. Francis Wood.—The Editor.)

Even the most casual perusal of history brings out the fact that the architecture of any period or people is a very accurate expression of their tastes, economic status and habits of life. Following out this fact in its present day application, we put our finger on the reason for the highly individualistic, cosmopolitan and unstudied design of the last decade. We have in each community exactly what we are ready to appreciate and maintain; portraying false ambition, extravagance, grossness, or refined restraint, thrift and good taste as the thought of the people dictates.

So it so often becomes true that the criticism launched against architects and builders is misdirected or overdone. They are, after all, but individuals in the community, building to satisfy community needs and ideals—not dictators in such matters, leading the people by the nose. Their function is much more largely that of educators than is generally appreciated. When they fail in this, their greatest opportunity, they either egotistically express something so radically new and individualistic as to be out of tune with their community, or lazily drift into banal repetition of discarded ideas for monetary gain or through sheer ignorance—both of which courses are as short-lived as the community dictates.

The New Simplicity

In a recent trip through Southern California, the writer was much impressed with a new and flourishing style in the domestic architecture. The Spanish colonial work of Mexico and the more pure and refined styles of Spain and Italy had been skillfully adapted to this region where climate and setting made the adaptation easy and logical. During the last few years through careful educational work the architects, decorators and landscape gardeners have been helping their community to see the beauty, comfort and economy in this new American, or California style—for it is new in its adaptations. In four years the whole character of the demand in houses, gardens and furnishings has undergone a radical change, a real growth toward something more permanent, just as the people have adjusted themselves.

The Need for Economy

One of the greatest factors in this advance step has been the economic factor — a demand for simplicity to offset high costs. It has been an easy thing to demonstrate that the extremely simple, square lines and details of this style are compatible with economy. Another great factor has been the so-called servant question that has so universally demanded simplification in the upkeep of the home. This, too, has been cared for in the structure and detail of this new style with the elimination of ornate moulded woodwork and built-in features, the use of easily maintained interior color schemes, floors with but little covering, and labor-saving mechanical devices. It is not a mere fad; it is not an achieving of some desirable effect extravagantly, but an appeal to reason, through economy and good taste—a sane simplification made doubly beautiful.

The average home builder of today is not in the mood to take up with fads, however attractive. The thinking public finds conditions, the world over, far too uncertain for indulgence of ideas that merely look or work well. So, anything new in the home must not only merit support but that support must appear easy to give and maintain, if necessary.

As an architect, I find many times that there are numerous features that meet with my approval; that work well, that look well. But in my function of educator, it is always a third demand—that of simple economy—that counts with the client.

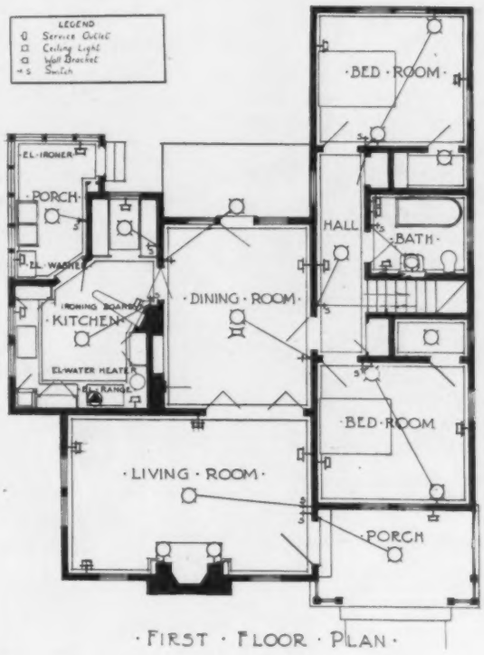
Cooperation to Meet the Needs of Today

Men of the electrical industry should not cross swords with the architect, builder, or even the owner on their apparent lack of cooperation. They should adjust themselves to the present day economic and social conditions and bend every effort toward simplification and economy. We are all convinced that electrical appliances for the home—and these are many—have come to stay. Put them within our reach! By "our reach" I mean the reach of the average small house builder or owner, for the wealthy still have most of the servants to ease their enthusiasm for labor-saving devices, and the poor are not building.

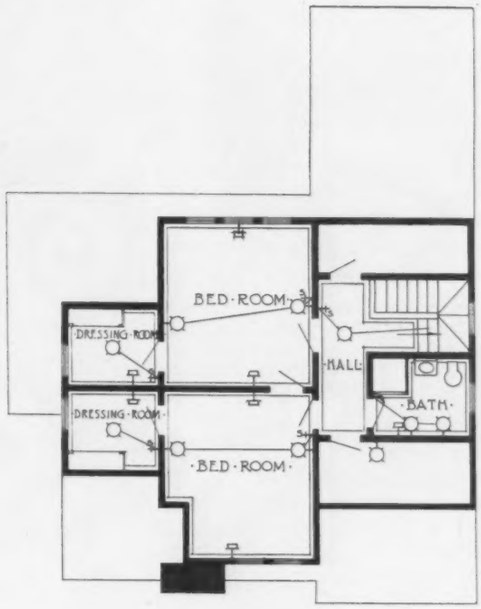
My short experience with home appliances has led me to believe that one of the best methods of reducing costs is a closer cooperation between the appliance distributors and the electricians wiring the house, in order to eliminate the present conflict of ideas and even ignorance as to wiring requirements. Another source of waste is in the lack of technical knowledge of those requirements among the architects. It would be well if the panel-board of an average house were kept so simple that it did not awe both architect and owner, for instance. Also, it would be well if all waste in wire sizes, circuits, etc., could be eliminated by cooperative educational work among all concerned.

The need for progress was never more urgent. The desire for it was never more prevalent. The basic conditions imposing economy, simplicity and permanence are fundamentally right. The day of intense individualism is past. Let us all strive for closer cooperation, with "Service" as our slogan, and all will be well.

How the Electrical Home Is Wired



· FIRST · FLOOR · PLAN ·



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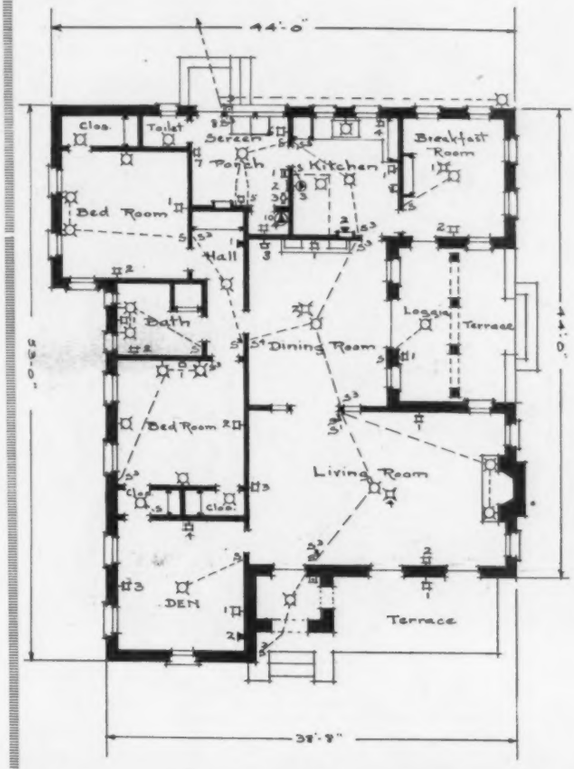
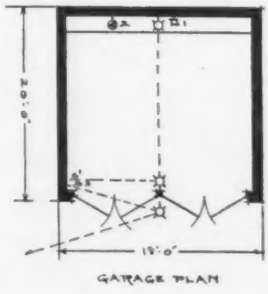




GARAGE PLAN

FLOOR PLANS OF ELECTRICAL HOMES

The two plans above show the wiring arrangements of Sacramento's electrical home, indicating the location, for both first and second floors, of outlets, ceiling lights, wall brackets and switches. The lower plans show the very complete outlet arrangements in the new Los Angeles home (E. B. Rust, architect), and its garage. There are four outlets in the living room and four in the den, to accommodate lamps, vacuum cleaner, phonograph, etc. The dining room has three outlets, the loggia terrace one, for a sewing machine, for instance, and the breakfast room, bedrooms and bathroom two each. On the screen porch are located the meter (1), the power and light distributing panels (2), outlets for the refrigerator (4), flatiron (5), washing machine (6), ironing machine (7), water heater (10), and a three-way switch (8) for yard and garage lights. The kitchen has outlets for dish washer (1), range (3) and utility motor or fan (4). The garage is furnished with an outlet for an extension light, and another for an air pump, battery charger, etc. This home will be opened for inspection about October 1st.

At Home In the Electrical Home

Convenience and Beauty Mark the Electrical Installations at the San Francisco and Oakland Electrical Homes

The bedrooms were wired with convenient base outlets for electric heaters, portable lamps, bed warming pads, and such comforts. In addition the dressing table was provided with a multiplex receptacle to make easy the use of the various electrical accessories to the toilet.

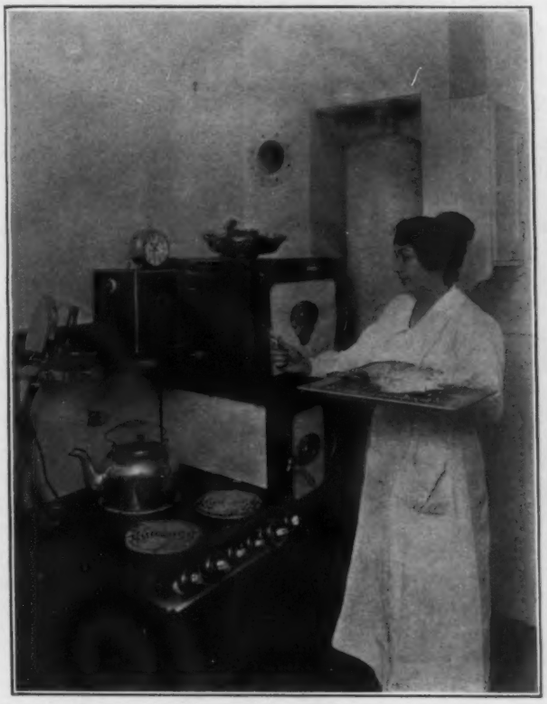
The Electrical Home interior should be planned with the greatest care to bring out the possibilities of convenience and beauty which a complete electrical installation can mean to the housewife. The views here shown of the arrangement of furniture and appliances in the San Francisco home in the St. Francis Wood show what advantage can be taken of the many opportunities which such an experiment offers. The house was completely outfitted from top to bottom with special forethought, even to such details as the placing of the meters and the installation of a fool-proof and intelligible fuse and switch panel.

The master switch at the bedside of the main bedroom was a feature which called forth especial interest from visitors. This switch is so arranged that at any sign of suspicious disturbance below, one light can be lit in every room, as well as lights in the rear of the house which cut off the avenue of escape.

The parlor was provided with portable lamps at strategic points, for all of which convenience outlets were provided close at hand. An electric log in the fireplace, an electric phonograph, indirect and wall bracket lighting and a baseboard receptacle for the use of the vacuum cleaner completed the electrical equipment.

The laundry was one of the most attractive departments of the house, with a complete outfit of washing machine, fan, mangle and iron. These were located in a sunny room just back of the kitchen which would ordinarily have been given up to the servant whose place in the home is now filled by electrical conveniences.

HOW ELECTRICITY ELIMINATES THE LABORIOUS FEATURES OF COOKERY



The kitchen is usually associated with strenuous hours spent over a hot stove, superintending cookery which has to be watched every moment, but the automatic electric range allows the housewife to do other things while the roast looks after itself. This kitchen was also wired for an electric fan, iron, etc., and had an electric water heater installed.

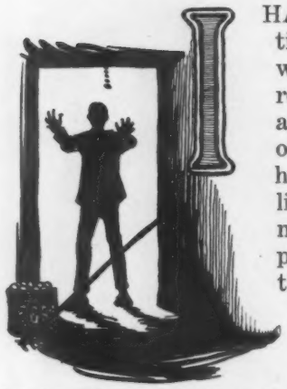
A feature of the breakfast room was a multiplex receptacle, attached under the table, which permits of several appliances being operated at the same time without trailing cords from distant baseboard outlets. A complete breakfast can be cooked and served sizzling hot without anyone getting up from the table.

On August 15th, under the auspices of W. H. Leimert Company, the third model Electrical Home opens its doors to the public for inspection. It is located in the Lake Shore district in Oakland, and will be introduced by an extensive publicity campaign similar to that worked out for the St. Francis Wood home on the other side of the bay.

A Woman's Convenience

BY A WOMAN

(From the architect, the contractor and the electrical industry en masse we have heard extended accounts of what the electrical home is. We now have the opportunity of hearing what it should be, from the final authority on the whole subject—the Woman Herself.—The Editor.)



Practice makes perfect. But why not have the switch at the door and conserve your profane vocabulary for more artistic occasions?

I HAVE been waiting for the time to come when there will be no more bargains in real estate on the market—and we may build a house of our own. For all my housekeeping career I have lived about in houses I did not plan, houses that were picked up at a bargain and that we lived in until a new purchaser should turn up who in turn would buy from us at a bargain—but at a bargain, be it said, somewhat higher in figure than the one we were party to some few months earlier in the season. I have lived in houses with views and houses without, houses with a garage and no servant's room and houses with a chicken house but no garage, houses with baseboard outlets all over the place and houses whose electrical facilities consisted of a remodeled gas jet in the center of each room—but of all the houses in which I have ever lived, not one was designed by a woman. You could tell it by the arrangements made for keeping brooms, you could tell it by the drainboards of the sink, but most of all, I think you could tell it by the lack of housekeeping knowledge displayed in the wiring of the house.

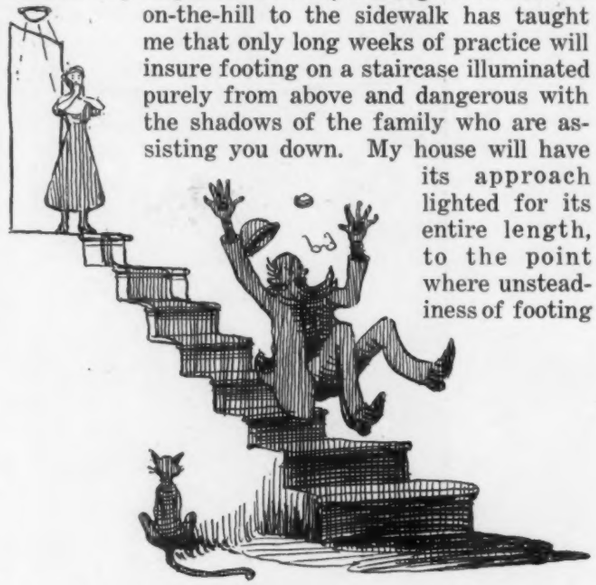
When I build my house, it is going to be completely wired to take care of any electrical appliance I may later want to put into it. I know it will be expensive, but I have found to my sorrow before this that it costs money, even more money, to have rewiring done after your house is all finished. I doubt if I could afford an electric range at the present time and besides, I notice the electric company isn't urging me to install one, but some day I am going to want one and I want to be able to install it without tearing out sections of the plaster and wall paper and then discovering that the wire which serves the whole house isn't big enough.

Catastrophes in Dark Corners

I am going to have electricity all over the house and what is more, I am going to have it in the places where I want it. I don't know why it is that a man who will have sense enough to put in an indirect lighting system, combined with outlets for table lamps in the parlor, will forget that cool-cupboards are occasionally used after dark and leave you to put your hand into the apple sauce when reaching for the cold meat; but it has been done, as I know to my sorrow. I want a light by the ice box, too. I am quite aware that ice boxes are not usually in place at the time that the wiring is put in, but it is a safe chance to take it for granted that there is going to be one eventually—and luxurious indeed is the house which has more than one available place for standing it.

Lights in the closets are not uncommon and I approve of them, particularly in the coat closet where family rubbers are to be sorted out on a rainy day and where umbrellas lurk in corners to descend upon the head bent in search of the hat which has slipped from the hook.

I have several other locations selected in which I shall arrange for lights. One is the stove, which will have the light so placed that it falls from one side and does not throw my own shadow on the frying pan where I am trying to see if the chops are done. There will be a light in the back of the house which will throw sufficient light into the back yard so that when I forget to take in the fur coat which is being aired for the moths, I will not necessarily fall over the blackberry bush and catch my chin on the clothesline. There will be a light in the coal cellar, too—where, incidentally, I always keep the logs for evening fires and which, in consequence, is visited in the evening, and there will be some means of lighting the jelly closet which does not necessitate groping across a floor cluttered up with jars of preserved eggs and garden tools to find a switch. A precipitous stairway leading from a house-on-the-hill to the sidewalk has taught me that only long weeks of practice will insure footing on a staircase illuminated purely from above and dangerous with the shadows of the family who are assisting you down. My house will have its approach lighted for its entire length, to the point where unsteadiness of footing becomes the responsibility of the city light department and the prohibition officer.



This guest was not kicked, he fell;—evidently an everyday occurrence on these badly illuminated steps, judging by the supreme unconcern of the cat.

Illuminating a House Tactfully

House-numbers as a rule are meant to be seen. There are occasions, familiar through much reading of funny papers, when the house-owner is presumed to be hiding from the bill collector and the piano agent, but even a number painted the color of the

This is simple, but wait until you have the piano here instead of the sideboard

house and overgrown with vines has not proved an insurmountable obstacle to such as sought with a purpose. Uncle Henry, who is to leave the young hopeful of the family thousands, on the other hand, has been quite annoyed at having to ring the neighbor's bell to inquire our whereabouts. My street number will be illuminated with a special light, all to itself.

Every hallway is to be lightable from the floor above and below it, as well as at a convenient point in its own vicinity. Bathroom lights will be located on either side of the mirror, bedrooms will have wall brackets rather than center fixtures, so arranged that there can be light enough at the bureau of the guest room for the visiting ladies to criticize their hair without having a blaze of light in the center of the room which will show up all the worn spots in the bedroom rug and rob the simple room of any charm it may possess. Oh, yes, and I shall also have sufficient lights in the parlor, so that wherever the idiosyncracies of my furniture determine that the phonograph must stand, it will have a light in its vicinity.

Convenient Convenience Outlets

This house of mine will have plenty of convenience outlets, so placed that they will be a convenience. This means that they will not be located in the baseboard of the parlor in the center of the only blank wall which gives space enough for the piano, so that you must either remove the piano when vacuum cleaning, or use a lamp socket. We used the lamp socket. I have been known to crawl under the sideboard when necessity demanded that the dining room be cleaned—but in my new home, the outlet will be located in one of the odd lengths of wall space uninviting for the larger articles of furniture and will, preferably, be located somewhat above the baseboard in an inconspicuous spot.

There are other things. I am going to have an outlet in my dining room floor for the dining room bell, but it will be flush with the hardwood, so that it will be possible to dance over it. For the same occasions and for obvious reasons, the fixture over my dining room table will be sufficiently flexible in its supports so that it can be hoisted above the forehead height of innocent visitors, for whose murder I have no desire to be responsible. And the electric iron: I am of simple tastes and open to reason, but I shall not be satisfied unless there are connections available for this useful implement in every room in which I am apt to want to use it—sewing, washing, or pressing clothes—and the cord is not connected overhead! Try dodging the cord when ironing from a middle-of-the-room fixture once and be convinced.

I am taking it for granted, you see, that all these

When trying to locate a blown fuse it is a good plan to use a strong 6-ft. stepladder and conscript the entire family to hold it. A still better plan, however, is to have the fuses located within reach, as this type of indoor sport is not an ideal form of entertainment at an evening party.

electrical conveniences can use the same connections and can be moved to all parts of the house. In the past I have found this not always so, but my house will insist on uniformity.

Wading Round the Dishwasher

I want a dish washing machine, but I want to be told what to do when using it in a city where the water is slightly hard and in consequence little rings form upon the dishes when they dry. Is there a solution which can be used without injury instead of soap, so that the water is softened? As for both this convenience and the electric clothes washing machine, which I already have, I shall be most particular about their being connected to an outlet pipe. One of the great problems about the electric washer, one that is a real inconvenience and spoils much of my pleasure in it, is that I must either drain it off into a bucket, which must be emptied at minute intervals, or I must let splatter all over the laundry floor in finding its way to the floor drain. If I am to have electrical convenience, the plumbing attached to it must be right. It is as much a part of the electrical installation—and I should think would be one of the concerns of the electrical contractor—to see that the space allowed for the washing machine provides a possible means of emptying it of water without a bucket, as to see that the outlet is provided. I presume the contractor is interested in selling the washing machine afterwards. Similarly, the matter of

our possessing a vacuum cleaner was delayed for some time because one of the "bargains" in which we lived provided no possible space for concealment of the machine short of the folding bed—and a vacuum cleaner is not the sort of thing you stand in the corner of your parlor.

The Festive Fuse

Last, but not least, I shall have the electric fuses at an accessible point in the house, near the spot where the family is likely to be congregated when the lights go out on a dark, dark night. The favorite location in "bargains" has been in the far corner of the basement, just above the spot where you store the lawn mower, which furnishes unstable footing in the dark. If possible (an arrangement, however, which experience would teach me is not probable), said fuses should be located within reach when standing on the floor and should be labelled. The man of the house in a dress suit, standing on a fruit box perched on top of a kitchen chair and reaching precariously for a fuse still above his head, while daughter stands on another chair holding a dripping candle as near as possible to the source of the difficulty and mother above calls down that that doesn't seem to be the right switch—this spectacle, I say, has entertained a houseful of guests who have been saved boredom by the short circuiting of the electric heater, but I shall not select it for one of the electrical comforts of my home.

No, I am for convenience—a woman's convenience, and some day when the fates and an electrical contractor and I combine, I am going to get it.

In Wiring the Electrical Home——

(It is possible for an electrical home to be almost as inconvenient as a medieval castle if the wiring is not intelligently done. Here are a few valuable hints from electrical men based on practical experience of electrical homes.—The Editor.)

1. Be sure that the floor plugs are flush with the floor. If they are raised even a little they make a worn place in the rug that may be put over them, a person is liable to stumble over it, and if it is placed in a hardwood floor it will be in the way in case the owner of the home desires to give a dance.

2. Be sure that the meter board is placed so that both meters can be read from the outside of the house, eliminating the necessity of the meter reader coming inside the house.

3. Be sure and have a light placed near the fuse block, connected between the fuse block and the meter so that the householder may have light to replace a burned-out fuse, instead of having to use a candle and getting candle-grease on his best suit, or burning his fingers with matches, and risk of setting the house on fire, due to "defective wiring."

4. Be sure and wire the bell circuit so that a bell ringing transformer will be used.

5. Be sure and label the fuse panel so that the next man will know which fuse to replace in case of a blowout without having to test the entire board.

6. Be sure and place the "convenience outlets" at a convenient height. Those in the living room can be placed in the baseboard but in the boudoir or breakfast room they should be the height of the table.

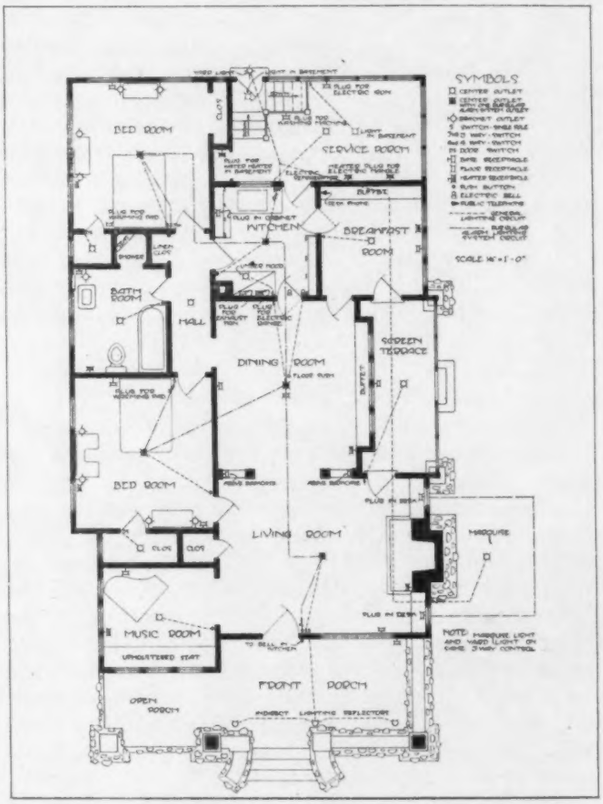
7. Be sure and install a two-way switch for exclusive day and night service. This will cut down the connected load on which the rate schedule is based.

B. Be sure and have one bed room in the house wired up for an extension telephone, bell extension, extra outlets, and separate switch for side and center lights. Such a room will prove of great value if anyone in the house becomes ill.

9. Be sure and have a three-way switch so that the power and lighting circuits can be used separately or together.

10. Be sure and have a master switch at the head of the bed that will control all the lights in the house irrespective of the position of their separate switches. This will save the houseowner many a heart-throb when he hears a noise down stairs in the middle of the night.

11. Be sure that basement and garage lights are controlled by three-way switches. They will save many steps and probably some bad falls.



The electrical homes which are now being opened to the public are by no means the first of their kind, as can be seen from the above floor plan of the home of H. H. Courtright, manager of the Valley Electrical Supply Company of Fresno, California. The indirect lighting reflectors used on the porches are among the many items which go to make this home beautiful and complete through electricity.

12. Be sure that the porch has a porch light that does its duty, that is one that lights the porch.

13. Be sure to have a switch controlling the lights of each room near the door. A snap switch at the fixture may be all right for certain types of fixtures, but some day the owner may want to put in indirect lighting.

14. Be sure to keep the circuits below capacity. In case the owner decides to add more lights there will be capacity enough in the circuit to add them on without having to put in an entirely new circuit.

15. Be sure that there is a light over the kitchen sink and the housewife will call you blessed.

16. Be sure and place a door switch on the closet doors.

17. Be sure that when there are two doors to a room there is a switch by each door so that the lights in the room may be put out or on by a person entering either door.

18. Be sure and advise the owner of the house as to the proper type of fixture to be installed so that he will have the maximum of efficiency from them.

19. Be sure and place at least one duplex receptacle in each room. The increase in cost is very slight, and it will provide for some use of current in that room which may have been entirely overlooked when the house was designed.

20. Be sure to consider the bathroom — a bracket light on each side of the mirror for the man of the house when he is shaving, an outlet for a shaving cup, and a baseboard receptacle for an electric heater. Also be sure that all sockets are of porcelain and that the wall switch is in a grounded switch box. Remember that more accidents occur in the bath room than in any other room in the house. "Safety First."

21. Be sure that you are right, then go ahead. Remember that every house you wire bears your trademark and that a mistake on your part will be remembered when all of the good work you have done is forgotten.

PERMANENT ELECTRICAL HOME DISPLAY

Another important step in cooperative publicity has been taken by the electrical dealers in Los Angeles with the installation of a display in the Permanent Exhibit of Household Economics inaugurated by the Evening Express.

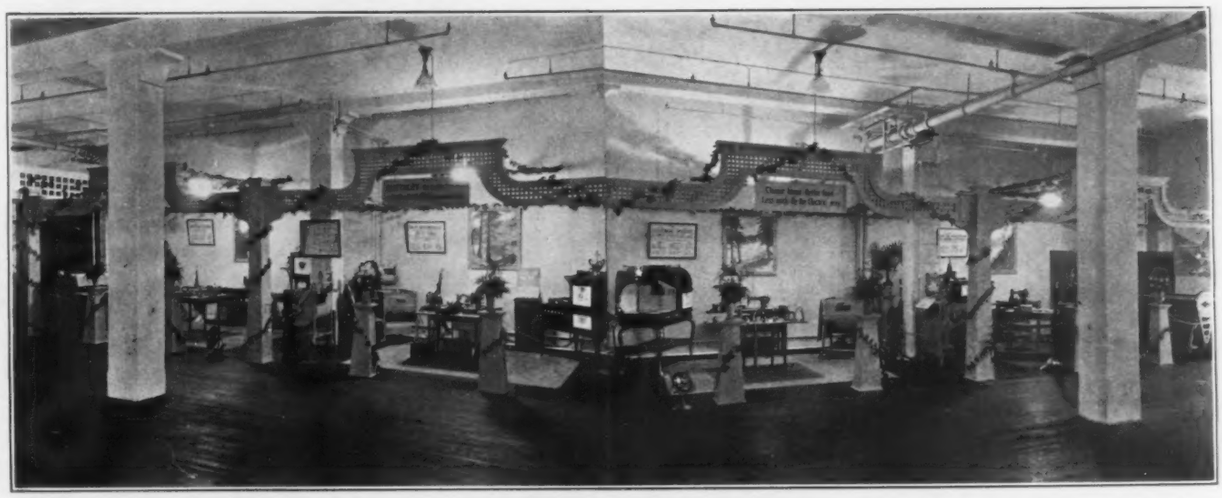
The third floor of the Express Building has been converted into an auditorium where daily lectures and demonstrations are given on the subject of better housekeeping. The wall space about the lecture room is devoted to permanent exhibits and one large section has been taken by the electrical men.

This section is divided into four booths, attractively arranged for the exhibition and demonstration of electrical devices suitable for the modern home. These booths are in charge of a paid demonstrator who is in constant attendance from nine to five daily.

The exhibit is proving particularly successful on account of its unique appeal to housekeepers. The plan is to arrange dates ahead with various clubs, inviting their entire organization to meet in this auditorium on the day specified. Mrs. Kate Vaughan, who has charge of the exhibit, arranges special programs and also serves lunch to the visitors. In this way the highest type of prospect is brought in touch with the exhibit and the program offered fits very nicely into their seasonal scheme. After the program the visitors quite naturally drift to the demonstration of the electrical appliances and a high percentage of live prospects is secured, over 200 being obtained during the first month of the exhibit.

Sometimes sales are made on the floor, the articles being secured from the various dealers in rotation. Prospects are secured and turned over to the contributing dealers to canvass. The usual methods of advertising by distributing circulars and follow-up letters are pursued. To date the average daily attendance at the lectures has been in excess of 200.

The dealers under whose auspices the electric demonstration is conducted are: Wilson's Electric Shop, A. S. Tyler, Foulke's Electric Shop, F. E. Newberry Company, and Electric Lighting & Supply Company.



Joint Exhibit of the Electrical Dealers of Los Angeles which is being given in connection with the Permanent Exhibit of Household Economics in the Express Building

There is no form of educational publicity which can familiarize women with the possibilities of electricity in quite the same way as can the use of it in the daily duties in the home. In this Practice House where students live and work as though in their own homes, the method electrical is employed in every possible branch of housekeeping.

Educating Women for the Electrical Home

BY MILLICENT L. SEARS

(Manufacturing labor-saving appliances does not make women use them, and while a certain conservatism in the human mind sometimes tends to hinder their adoption in the home, the same quality tends also to make them indispensable to women who have been trained to use them. In this connection few educational campaigns could be more effective than the type of course given this summer by Professor Millicent Sears, formerly head of the School of Home Economics of the University of Nevada and State Supervisor of Home Economics Education for Nevada.—The Editor.)

The electrical home idea is now being promoted by the universities. One of the features of the instruction in Home Economics at the University of California summer session is a course in household management which includes the use of electrical labor-saving devices as part of its regular routine.

In recognition of the fact that the efficiently managed modern home necessarily involves a familiarity with these devices, arrangements were made to secure one of the fraternity houses to be used as a demonstration or practice house during the summer months. Unfortunately the house was wired only for lighting, but by means of many two and three-way plug sockets the necessary appliances were accommodated. These, which were all lent by the Pacific States Electric Company, include an electric range, washing machine, ironer, sewing machine, ovenette and vacuum cleaner, as well as all the smaller appliances—various types of electric heater, a coffee percolator, toaster, electric iron, and so forth. The interest of the Berkeley electric firms was shown by the fact that W. E. Knowles of the Campanile Electric gave freely of his time and effort in the original placing and connection of the equipment.

Practical Housekeeping

A few students live in the house, performing all the regular duties of housekeeping, including cleaning, washing and cooking, with the aid of the labor-saving electrical appliances. In addition, large regular classes assemble in the house for practical work. Each of the half dozen students will bring a week's washing and put it through the complete laundry process with the electric washing machine, ironer and flat iron. Meanwhile another student operates the vacuum cleaner, while still others cook light meals. Appetizing stories are told, by the way, of strawberry shortcake baked in the electric ovenette. The whole idea is to conduct a genuinely homelike establishment where the student learns to handle the actual routine of daily housekeeping in the most efficient way, and acquires a familiarity with modern methods which will be of inestimable value to her when she applies them either in her own home or in teaching.

On one occasion, as part of their required work, the entire class made an expedition to San Francisco's new electrical home, inspecting it throughout, and wrote a full account of their impressions.

Learning Repair Work

In addition to the household routine, the house management course includes special lessons and demonstrations in the simple wiring requirements of the electrical home, the connection of wires to plugs, the replacement of fuses, and minor repairs which the housewife may be called upon to handle herself. If a fuse is blown (and occasionally one is blown deliberately for demonstration purposes) it is replaced by a member of the class. The familiarity thus acquired with electrical appliances accomplishes a great work in destroying that fear or distrust of electricity which makes some women so reluctant to use it freely in the home. It is noticed that many of the students begin by being afraid to handle the appliances, but quickly overcome the fear, and learn to appreciate the increased efficiency of the method electrical.

Spreading the Electrical Home Idea

The class consists of about sixty students from all parts of the United States. They may be roughly divided into three general classes: the younger students, consisting chiefly of brides, or freshmen just entering college and preparing to "keep house" in an apartment; the more mature students, who are largely teachers from various schools and colleges, and desire to bring their knowledge up to date; a number of auditors, mainly local housewives, who, though they do not take part in the active work of the class, attend the meetings regularly for the purpose of gleaning new ideas and short cuts in household management.

The idea of the Practice House has taken root in some forty educational institutions in the United States, and though complete electrical equipment is not an integral part of all of them, or of the Home Economics departments as a whole, the natural tendency is of necessity in that direction. The University of Nevada, for instance, has just installed a large electric range in its new $80,000 Home Economics building, and another is being installed in a small but progressive high school.

The class in cookery works in an electrically equipped kitchen, using in addition to an electric range, the electric ovenette shown in the foreground, and various other small appliances.

The introduction of electrical apparatus into these departments, with special emphasis on their use, marks a great step forward in the promotion of better equipment for the home. The bride and the young student just starting housekeeping will come to consider labor-saving devices as indispensable to the properly conducted establishment; the teachers who use them will introduce them among their own students, and thus spread the idea in new and ever-widening communities; and the experienced housewife watching the appliance in use, acquires a new viewpoint which will influence her household buying in the future.

Special Significance for the West

In the West, where electric power is comparatively cheap, even isolated ranches up in the highlands are constant users of electricity, especially when they are located near streams. On many of these ranches we now find modern electrical devices even in the home, replacing the labor of the farmer's wife. Children from such ranches, when they get ready for high school, expect the electric washer and the electric stove in the Home Economics class room, just as children of a decade ago had to find wood stoves in order to duplicate the home in the high school. Teachers are now realizing that if they would live up to their motto, "To prepare the girl for the kind of life she will go into," they must teach her the use of electrical devices and conveniences.

The various home-making duties are assigned to different groups of students in rotation, some doing the laundry work, with an electric washing machine, ironer and flatiron, while others clean the house or cook.

The question of education in the use of labor-saving devices is especially interesting in the West, where there is a scarcity of help and where the woman naturally welcomes any methods which will transform household drudgery into a light and smoothly-running routine.

ENGINEERS OF YESTERDAY

20. Murdock.

Do you know that the inventor of the slide-valve and the inventor of gas lighting are one and the same man?

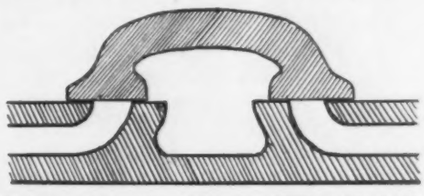


Diagram of the "D" slide valve, William Murdock's most important invention in the steam engine line.

William Murdock (1754-1839) in early life was a millwright, but the momentous turn in his affairs was in 1777, when he entered the employ of Boulton and Watt at Soho. Rising to a position of responsibility, he employed his genius in many inventions. We read of an oscillating steam engine in 1784, a steam road carriage in 1786, and later of a steam gun, experiments with compressed air and a proposed rotary engine.

The production of illuminating gas from coal was perhaps his greatest work, this being accomplished in about 1792. The first burners, because of the shape of the flames, were called "the cockspur" and "the cockscomb." They were soon followed by the familiar "batswing." His most important invention in the steam engine line was in 1799. This was the "D" slide-valve, now in such common use.

View of bungalows in the residential district of Atascadero, where the electrical home idea is making great headway. Almost all the houses are wired with convenience outlets, and use many electrical labor-saving devices.

Electrical Progress in a Model Colony

BY SIDNEY BRETHERTON, JR.

(In the agricultural community, where electric power is a necessity for irrigation and other farm purposes, the electrical home is a logical and normal development. The following story tells of the contribution made by electricity to the growth of a farm community, and indicates the progress of the electrical home idea.—The Editor.)

The Atascadero estates, forty square miles in area, are located half-way between San Francisco and Los Angeles in San Luis Obispo county. They embrace rich and fertile valleys, rolling hills and a chain of mountains on their western side.

In 1913 Mr. E. G. Lewis purchased these estates with the idea of founding a model community in which the city would be developed by and dependent upon the surrounding agricultural land; a community in which the basic idea should be cooperation.

Demand for Electricity Exceeds Supply

Atascadero and the coast regions about are furnished with power by the Midland Counties Public Service Corporation, a subsidiary of the San Joaquin Light & Power Corporation. Due to the colony's position on the end of their lines and the last three dry years, the company has not been able to keep up with the rapid growth of the section. Every effort is being made by them to cope with the situation, an article, "Electrical Development in the San Joaquin Valley," by Mr. A. G. Wishon, in the May 15th issue of the Journal of Electricity, giving a very comprehensive idea of what they are doing in the way of hydroelectric development.

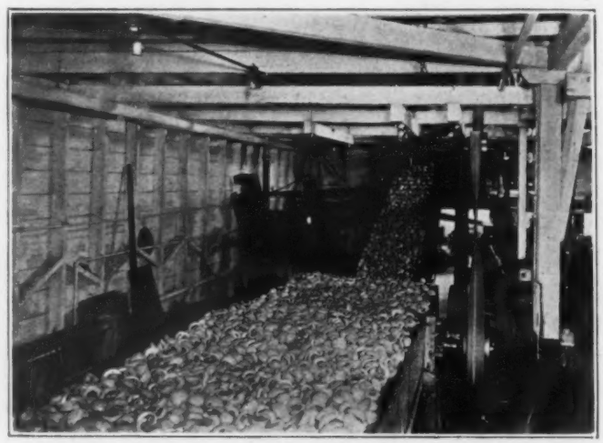
Electricity has played an important part in the development of this colony. All the buildings housing the industries are modern in every detail, and in nearly every case electricity is used as the motive power.

Development of Industries

To handle the products of the agricultural lands, the Caladero Products Company was incorporated and one of the finest dehydrating plants in America was built. In the dehydrating plant all machinery is motor-operated and so arranged that a minimum of shafts and pulleys is used, assuring the greatest possible safety to employes. The coring, washing machines and conveyors, each have a separate motor with the starting device so placed that the foreman has instant control of his machine at all times. Work is seldom if ever done at night, yet an excellent system of lighting has been installed.

The first industry to be established in Atascadero, along other than agricultural lines, was the Press, which publishes the Illustrated Review. The Rotogravure Process, used in the printing of the Illustrated Review, is essentially an electric one. When the proper material to make a page has been assembled, it is photographed by the use of large arc lights. From the negative produced here, a positive film is made with the help of a mercury light. This film is then placed on a copper cylinder, previously electro plated, and the photographs etched in with acid. These cylinders are then placed in the large rotogravure press and the page printed. The newest addition to the electrical equipment of the press is a large melting pot for linotype metal.

One of the newest firms, the Radio Photo Equipment Company, is building an electric machine for printing post and business cards at the rate of 600 per minute. This requires an extreme intensity of light focused on a small area to produce instantaneous action on the sensitized paper. They are now working on an addition to this machine that will eliminate the slowness in drying the cards after they come from the developer and are washed.



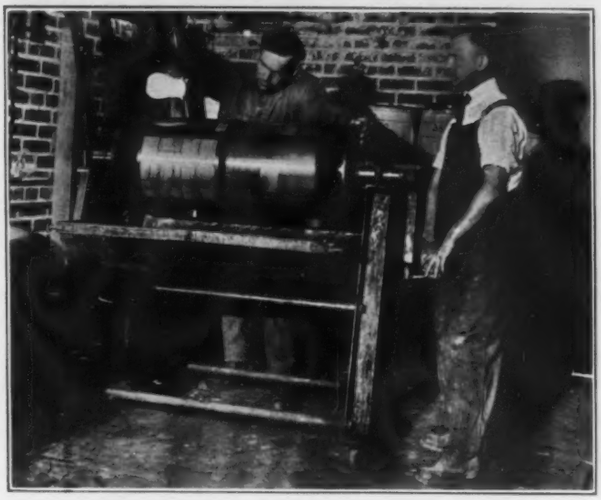
The electrically operated washing machine in the dehydrating plant

Here was one instance of where the contractor-dealer, with the aid of the jobber and manufacturer, was able to help in the solution of a light and heat problem.

New Building Activities

The Mercantile building, which houses all the stores of the colony, is now so filled that the original lighting and power circuits became inadequate. This necessitated running circuits to the new departments, and as a central point of distribution had never been planned, it was necessary to install a switch and meter board, controlling all the circuits.

The newest building is the hospital, opened on August first. It is fully equipped with electrical



Etching copper cylinder, Atascadero Press. The newspaper industry was among the earliest in the community to use electric processes.

devices, and the battery of six sterilizers, the hot water system, the dumb waiter and the laundry are all electrically operated. Convenience outlets have been placed in every room for heat and light besides the usual call and telephone connections.

It is in the agricultural districts that the shortage of power is felt. People whose land needs irrigating are waiting for available power to install motors and pumps. It is in this district that the model chicken ranches have been placed. Their equipment has been handicapped, as they have been forced to use the kerosene incubators and brooders. Lack of power is also holding back the installation of modern machinery for alfalfa cutting on some of the general ranches.

Electrical Homes

Though the majority of homes here are small bungalows of five and six rooms, nearly all have been wired with a sufficient number of light and convenience outlets. This is the result of an educational campaign carried on with the help of J. Roth, the architect, and the general contractors, making the owners realize that proper wiring is a good investment and a necessity rather than a luxury. In each case that additions have been made to the original wiring plan, the advertising value resulting from the satisfaction of the owner with his home when completed has more than repaid any time and effort expended.

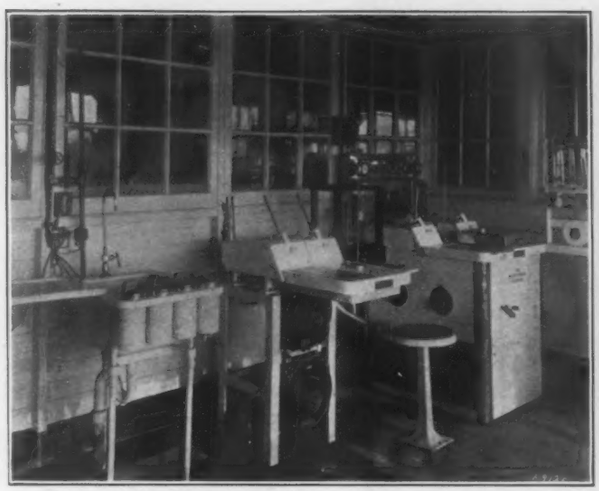
At present there is under construction a house that will rival the Electrical Home in St. Francis Wood in San Francisco. In addition to the proper outlets and switches there is to be a vacuum pump in the basement with hose and switch connections at several points in the house. An electric refrigerating plant is to be installed, and the house is to be equipped with all the latest household electrical appliances.

This colony has no gas service or coal for fuel, and wood is extremely expensive. As a result most people use kerosene for cooking but are having their houses wired for range service, awaiting the time when the power company can take on this load.

Local Service

Through the solution of small electrical problems, the people of Atascadero have come to realize that the place to receive electrical service is at their local dealer's, and in the solution of the larger problems the hearty cooperation of the jobbers and manufacturers has always been forthcoming. This cooperation has built up a real electric service, which has been and will continue to be an important factor in the development of the community.

The upper picture shows a fine grove of four-year-old trees, and the lower shows last year's bumper peach crop from them. The agricultural activities of the community demand for irrigation far more electric power than is obtainable at present, though new hydroelectric developments will soon relieve the shortage.



The laboratory at the Benham Ice Cream Company's plant. Here the cream is tested for butter fat content and brought up to standard.

The 40-gallon-per-hour ice cream freezer where the mixture goes through its final process before passing to the hardening room.

Making Ice Cream Electrically

(Keeping a community cool in summer is a task demanding as much electricity as that of keeping it warm in winter. The following interesting description of ice-cream making is typical of the extent to which manufacturing plants of all types are coming to depend upon electric power.—The Editor.)

Among the industries in the San Joaquin Valley for which a large amount of electric energy is used is the manufacture of ice cream, water ices and sherbets. One of the largest manufacturing concerns of this character in the West is located at Fresno—the Benham Ice Cream Company, which was established on a small scale in 1906, and this year will have an output amounting to about 650,000 gallons. Of this amount, approximately 250,000 gallons will be distributed in, and immediately adjacent to, the city of Fresno, through nearly every confectioner's store, grocery store, drug store, etc. The balance is shipped to all the towns and suburban stores throughout the San Joaquin Valley and in the mountains to the east, so that a person may travel anywhere throughout this section of the state, whether it may be away out in the oil fields or the west side grain fields, or high up in the Sierras, and procure a dish of "Benham's Ice Cream," "made electrically."

Employing Five Thousand Cows

During the summer the plant is run on a twenty-four hour basis, and 4500 gallons of cream is used per day, representing the output of 5000 cows. The peak load for this summer is expected to be 6000 gallons of ice cream, water ices, etc.

The surplus cream during the winter months is condensed and used later to bring the butter fat value of the "mixtures" up to the required percentage by mixing with the fresh cream as required. Part of the surplus is sold for the manufacture of butter and cheese; and it might be interesting to note that the peak load of the ice cream factory is in the summer time and the peak load of the cheese manufacture is in the winter.

It is reported that a half-million pounds of sugar is required by this plant this year in the manufacture of ice cream, ices and sherbets, and 500 tons of salt. In order to pack the product for delivery on the peak load day, sixty tons of ice is required, and this is manufactured within the plant. The daily "refrigerating capacity" of the plant is eighty tons.

How Ice Cream Is Made

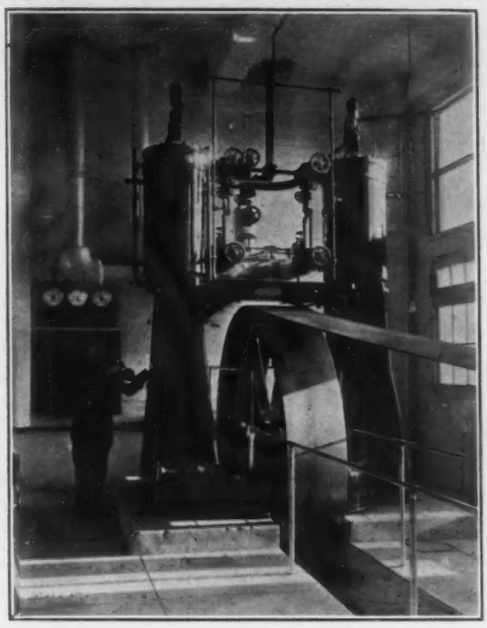
The cream, as it arrives from the San Joaquin Valley Milk Producers' Association creameries, is first tested, samples being taken from each batch and a record kept of the butterfat content, and sufficient cream, condensed during the dull season, is added to bring the test to standard. For the purpose of these tests a very elaborate laboratory containing equipment costing over $3,000 is maintained. The enriched cream then goes to a large mixer on the third floor, where sugar and other ingredients are added, and the "mix" is pasteurized. The mix is then drawn into a homogenizer in which the fat globules of the cream are broken up, making the mixture smooth and velvety, after which it is drawn off into large glass-enameled holding vats of 5500-gallon capacity each, in which it is held for twelve hours undergoing the process of ageing and ripening in order to prepare it properly for freezing into cream of uniform texture and quality. This process is all on the second floor.

The mixture is then drawn into the freezers on the first floor. There are four 100-gallon-per-hour freezers, each equipped with a 7½-hp. motor, and twelve having a capacity of 40 gallons per hour each, driven by 2-hp. motors. These freezing machines are not such as most of us would picture; they are not built on the principle of a can which revolves in ice, but consist of a stationary cylinder, silver lined, surrounded by an air-tight space in which is coiled, close against the side of the cylinder, rectangular-

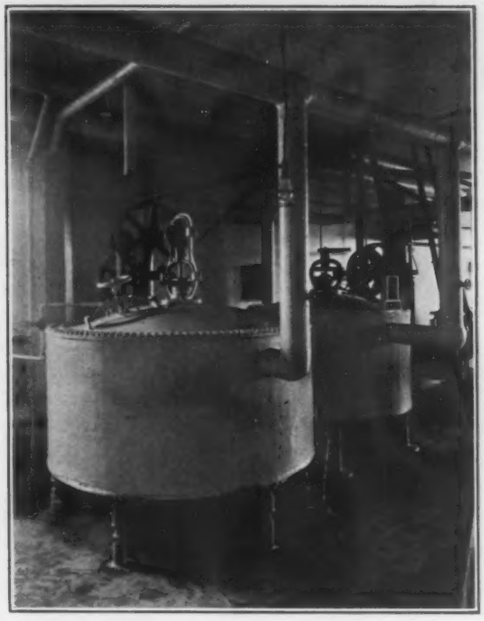
shaped copper pipes through which the brine is circulated sixteen times around the cylinder at a temperature of 0° F. while the mixture within the cylinder is agitated by two sets of paddles which rotate with two different motions similar to the paddles in the common home freezer.

The flavoring is added to this mixture as it is drawn into the freezers—a specific amount being added to each freezer batch.

The cream is not frozen hard in these freezers, but is drawn off at a pasty consistency into the cans or molds, and passed immediately into the hardening room where it hardens and ages. This hardening room is kept at a required temperature of 10° or more below zero, F. by means of a current of air blown against ammonia expansion pipes, and in here



One of the ammonia compressors where the ammonia, expanding, extracts heat from the brine used as a refrigerant.



Tanks where the ice cream mixture is made, and held over to ripen. It is frozen to its final state in a special freezing room.

the cans and molds are left for four hours before they are ready to be sent out for distribution.

Ices are prepared in the mixers on the third floor and drawn from there direct into the freezers; also frozen puddings. The punches are prepared, as a rule, by hand.

Special Equipment

Containers are thoroughly cleansed and sterilized of course before being filled, special machinery being used for this purpose. Centrifugal brushes, through which streams of boiling hot water are sprayed, scour the cans, after which the cans are placed in sterilizing machines where they remain in boiling water for one minute; they are then placed on a rack where they dry almost immediately, on their way to the freezing room.

The company operates specially built trucks for distributing the product in and around Fresno, there being twenty of these vehicles in all, part of which are Walkers and part are General Vehicle Electrics, having a capacity of 300 gallons of ice cream and two tons of ice and salt. Some of these trucks are nothing less than refrigerating rooms on wheels, having brine circulating pipes so that the compartments, in which the ice cream is stored for delivery, are kept cool.

The company operates its own charging outfit, using a motor generator set for the purpose.

The company does not deliver beyond the immediate vicinity of the city of Fresno with its own trucks, but delivers to the auto stage lines and express service systems through a very comprehensive schedule under which dispatching is carried on practically throughout the entire twenty-four hours; in fact, most of the orders come in from the Valley points at night.

All the ice and salt required for packing is delivered with the product, the ice itself being manufactured in this same plant and crushed by two crushers having a capacity of twenty tons per hour. The concern also distributes cones on a jobbing basis, distributing 2,000,000 of these last year.

Besides the fifteen employes required in the office and order rooms, as many as ninety-five employes are required in the factory during the summer.

The plant contains a 50-hp. steam boiler for sterilizing and heating purposes, and for condensing the milk surplus. Water is pumped from private wells for all uses in the plant. The principal compressor is driven by a 75-hp. motor, and there are two small ones driven by 25-hp. motors. There are 34 motors in all, with a total capacity of 226 hp., and the maximum 15-minute demand to date is 181 hp. One of the most novel features is the last electric truck which has been equipped with a complete refrigerating plant. This truck has two product compartments and is equipped with an electrically-driven system instead of refrigerating with salt and ice.

The use of electricity in the ice cream plant facilitates a process which is very exacting, and which is subject to very heavy demands during the rush season, and requires great flexibility. On account of the requirements for complete sanitation individual electric drive is considered the only satisfactory method, and the owners and operators of this plant find absolutely no inconvenience, in fact, they never have to think of their driving apparatus and are free to give all their attention to the manufacture and delivery of a product in which uniformity and reliability are particularly to be desired.

The plant represents an investment of over a quarter of a million dollars, and it is said that it is the most complete and largest of its kind west of Chicago, not even excepting San Francisco and Los Angeles factories.

RAISING CHICKENS ELECTRICALLY

BY M. S. BARNES

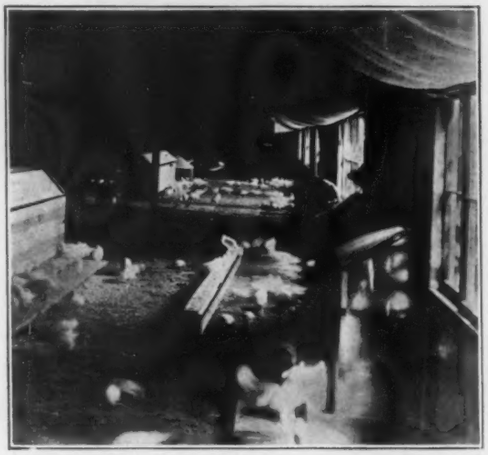
(Labor-saving devices on the farm are among the most important contributions which electricity has made to rural progress. Following is an account of a plant which eliminates practically all human labor, and accomplishes efficiently a task which formerly could only be undertaken on a much smaller scale and with infinite trouble.—The Editor.)

A chicken-brooding plant said to be one of the largest, most modern and scientific in the world, has been built by J. W. Dobbins of Sebastopol, California. It is so scientifically and conveniently arranged that the services of only one man are required to raise and handle thousands of chickens. The electrical features of these modern chicken brooders have contributed so much to their success that a new field has been opened up for further practical application of electrical appliances. This installation should prove very interesting to power companies as well as to manufacturers and electrical contractors, because the large number of Mazda lamps together with the heaters and motors make up a combined load which is well worth while. This load extends over a period of approximately nine months, beginning the latter part of September and extending into June.

At the present time Mr. Dobbins has four brooder houses. One is 20 x 130 feet and is equipped with a 16 x 20-ft. four compartment brooder for taking care of 4,000 chickens. The other three houses are 20 x 100 and have 9 x 16-ft. single compartment brooders, each capable of handling 1,500 chickens.

The brooders are the acme of perfection, and are designed and built entirely on new principles. The usual principle of brooders is to set the unit of heat at a central point and place the chickens about it, or to set it in a long line brooder and have the chickens run in or out on one side. These principles, according to Mr. Dobbins, are unscientific in that they do not radiate the heat so as to cover all the chickens at one time with an even and uniform temperature. The new principle which he has worked out reverses this old method, and instead of placing the chickens around a central heating unit it completely surrounds the chickens with the heat.

All the brooders in the three smaller houses are similar. They are constructed in a rectangular form 9 feet wide by 16 feet long with a well hole of 5 x 12 feet in the center. This well is surrounded with a double coil of one-inch hot water circulating pipes placed under a board covering two feet wide all around it. Around the outside of the brooder is a six-inch fringed billiard cloth. The well has a cover which can be raised or lowered. It is equipped with a ventilator in the apex or center controlled by a thermostat. When the chicks are put in at the start they are kept in the well space during the entire first day. The next day they are allowed a three-foot space all around the brooder. This space is enlarged day by day as they grow older. The feeding during the first two days is done in the well. The brooder in the larger house is of the same design except that it is larger and subdivided. Each of the four brooders has an independent hot water circulating system, heated by the latest 2-kw. electrical heaters which have been developed by the Edison Electric Appliance Company. They are all equipped with thermostats which maintain a remarkable evenness of temperature in the brooders.



Drinking fountain, window blinds, feeders and so forth are all automatic in this new electrically equipped chicken brooder, and only one man's labor is necessary in the raising and handling of thousands of chicks.

Putting the chicks to bed at night has always been a problem, but this difficulty has been overcome in a very novel and simple manner. Lights have been placed around the inside of each brooder well. When the time comes to put the chicks to bed the attendant simply turns off all lights except those in the brooder. Since chicks do not like to be running around in the dark they immediately flock into the brooder where the light is and in a few minutes the lights can be turned out and all the chickens will be in the brooder. Each of the buildings is thoroughly lighted so that the houses can be brilliantly illuminated in the morning and late afternoon in order that the chicks can be kept busy 15 hours a day. There are 115 40-watt lights in the four buildings.

The drinking water is supplied by new principle fountains. They are designed to furnish fresh running water constantly and at the same time are automatically self-cleaning. Each fountain is equipped with electric lights for night use. The lights illumine the rippling surface of the water and the chicks

will drink where otherwise they would not. Other conveniences such as blinds for the windows, automatic feeders, and so forth, are all worked out so that the routine involves a minimum amount of time and labor.

The water supply is taken care of by a 5-hp. motor controlled by a float switch. This automatically furnishes an abundance of water at all times. Another motor is used for the feed cutter. Vacuum cleaners are used to pick up all straw, dust and dry droppings. Each house is supplied with a stationary motor-driven spraying pump and whitewashing apparatus equipped with a sufficient length of hose to reach every crevice both inside and outside the building.

The electric control of the whole plant is most thorough and complete. All human agencies are eliminated wherever possible. An electric bell system is so arranged that an alarm is sounded if the heat or lighting fails at any time.

Offhand, one might think that this would be a very expensive system to operate, but such is not the case. During the worst month of the year with a new batch of young chickens, the cost for current will not exceed $120.00. Any other system would require more help in addition to the maintenance of some other class of heating and lighting.

The plant has shown a remarkable record for percentage of chickens raised. It has been so satisfactory that the owner is now planning on another larger and more elaborate building.

The electrical equipment and the circulating water system were furnished and installed by the J. L. Bone Company of Sebastopol. Due to the showing of this plant Mr. Bone expects others to fall in line.

ELECTRICITY IN A MODERN HOTEL APARTMENT HOUSE

(Newly erected buildings in up-to-date cities are becoming more and more notable for their electrical equipment. A thoroughgoing example of this evidence of progress is afforded by the new hotel apartment house described below.—The Editor.)

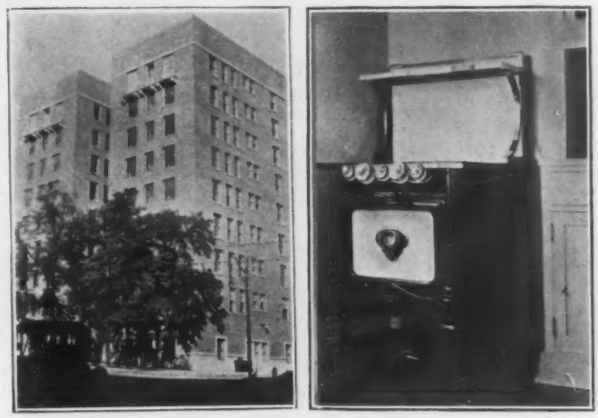
The installation of electric ranges exclusively in the new Belvedere Hotel Apartments in Salt Lake City is part of a consistent managerial policy by which the highest possible class of service in every department is rendered to the patrons of the establishment.

This is the first hotel apartment erected in Salt Lake City, and will have one of the largest, if not the largest single installation of electric ranges in any one building in the United States.

The building contains 147 apartments in each of which is installed a beautiful Westinghouse 2-19 B semi-automatic electric range with white enamel door and splasher to harmonize with the white enamel finish of the entire kitchen.

The exterior of the building is of red tapestry brick trimmed with polychrome terra cotta and a gray granite base. The lobby walls are of Caen stone, black and gold, marble base, black and white marble floors, elevator doors glazed with small panels of crystal mirrors, beautiful candelabra lighting fixtures finished in polychrome and gold with silk shades, giving the lobby the quiet elegance of a palatial home.

Opening directly off the lobby is a beautifully appointed lounge and ballroom in which special attention has been given to artistic lighting. A billiard room has also been provided for patrons at a cost of approximately $100,000.



At the left is a partial view of the new electrically equipped apartment house in Salt Lake City. The right hand picture shows one of the modern electric ranges installed in each apartment.

The lighting fixtures for all apartments are specially designed candelabra chandeliers of various characters, some finished in silver and others in polychrome and gold.

The building is steam heated from a central heating plant in the rear and is also equipped with a refrigerating and filtering system, electrically operated.

The apartment will require approximately 30 kilowatts for lighting, 100 kilowatts for fuel and 45 horsepower for elevator and miscellaneous power operations.

Miller, Wooley & Evans of Salt Lake City were the architects and the building was erected by Villadsen Brothers, Inc., general contractors. The building is the property of the Mormon Church, but is leased and operated by the Ensign Investment Company of which Dr. J. T. Keith of Salt Lake City is president.

The formal opening of the apartment will occur November 1.

SWISS MARKET FOR ELECTRIC WASHING MACHINES

With the ever increasing supply of electrical energy furnished by the development of Switzerland's vast resources in water power, consideration of various electrically driven household appliances is growing from year to year. Up to the present time the use of washing machines in Switzerland has been very limited, and electrically driven machines have been utilized only in public laundries. A local manufacturer of sanitary appliances who has branches established in Paris and Antwerp is interested in American electric washing machines, and is disposed to undertake the representation, being of the opinion that now is the proper time to introduce these appliances into Swiss households.

Manufacturing Fun

(In the amusement park as in no other place, electricity reigns supreme as the official joy-maker. The story of its work in this capacity at Idora Park, Oakland, California, is told here in some detail, showing that every nook and corner of the park must employ some sort of an electric motor to make it a success.—The Editor.)

The older scenic railroad is shown in the background and the tower which supports the whirling airships is seen in the foreground.

IN the amusement park electricity plays a different role from the one played in the factory, in the mine or on the farm. In this one capacity it plays the role of fun-maker, and for this reason the story of the park electrician has a distinct human interest touch.

When, on a flourishing holiday afternoon, L. P. Desimone, Idora Park electrician, was asked to tell his "behind the scenes" story, he led the way to the nucleus of the park, a small green power house. Here he explained that the power, which is furnished by the Great Western Power Company, comes from the power station at Fourth Avenue Heights in East Oakland over lines which also carry power to the factories of West Berkeley. Power enters the park at 11,000 volts. A switch at the entrance makes it possible to shut off the entire supply in case of any serious fire and arrangement for connection with a neighboring 11000-volt line makes it possible to get power from this source in case anything goes wrong along the line regularly used.

Three Star Delta, 6500-volt, three-phase, 60-cycle transformers step the power down to 220 and 110-volt current and from here it is distributed to the various buildings and concessions for lighting and power purposes. An economical and somewhat unique practice is that of taking both the 220 and 110-volt current from the same bank of transformers. The 220-volt is taken from a straight tap and then the 110-volt is taken off a 50% tap. In accordance with this arrangement, all current used in the park is rated off on a 220-volt meter, then the 110-volt current is registered on a 110-volt meter so that the amount of actual 220-volt current used is found by subtracting the reading of the 110-volt meter from that of the 220-volt meter.

Balancing the Load —

The method of distribution used in Idora Park is different from that ordinarily used in places of this sort in that the three-phase current is carried direct from the transformer to the buildings and balanced through the wiring there rather than at the power house between the various buildings. The electrician states that in this way each building is independent so that any trouble which may occur in one does not entail difficulty by unbalancing the load supplying other sections of the park. It will be seen that this method of distribution also means an economy in wiring, which is an item worth considering when fifty or more buildings and concessions are to be supplied.

Economy in Wiring —

In lighting certain small buildings and concessions which are located at a considerable distance from the power house, it is found more satisfactory in every way to supply the point only with 220-volt current, using this for lighting as well as for power purposes. In these cases the motor used in operating the concession must not be overloaded, and the current for lighting is taken off the power feeds. The use of 220-v. current for lighting of course entails the use of lamps which are more expensive and fragile than those ordinarily used, but because of the saving in wire and because a higher rate is charged for 110 than for 220-volt current, this practice has been found a distinct economy when conditions above mentioned are true.

A 100-hp. motor is used to operate the "Race Thru the Clouds" shown above

The Concession —

In a place where power is used at as many different points and controlled by as many different men as it is in the amusement park, it is necessary to work out some system by which the manager may know just how much power is being used monthly at each point and whether or not it is being used to the best advantage. At Idora Park a book is kept in which are drawings of every building and concession in the park. This set of diagrams includes every wire, every motor and every lamp on the grounds, so that the manager at his desk can know where every bit of power is being used.

Each concession is furnished with an individual meter and record cards are given the men in charge of the operation and lighting of each concession and building. In keeping the lighting record the man records how many lights are turned on each evening at seven o'clock, how many at eight, and so on. Under the power record, he records every time the motor is turned off and exactly how long it runs.

It is found that this practice of requiring the employes to keep a particularly detailed record tends to make them more careful with the power they use. They are not liable to do the easiest thing and turn on the lights in and around their building at six-thirty or seven o'clock when they know that an exact record of this must be kept. In fact, it is found that this practice, along with the knowledge that every record is filed in the manager's office, does much to increase the operator's interest in and his respect for his work.

Motors Used in Operating Concessions —

For the most part the motors used in operating concessions are three-phase, 220-volt, of one of the standard makes. Some of these have a twenty-year record of continuous and satisfactory service behind them.

The largest single motor on the grounds is that used in pulling the scenic railroad cars to the top of the grade from where they start their dashing "Race Thru the Clouds." This is a 100-horsepower General Electric motor of variable speed. The cost of operating this concession is forty dollars per week, so far as lighting and power are concerned. A fifty-horsepower Westinghouse motor operates the older scenic railroad, and one of the same size and make is used to run the paddle wheel used in that most fascinating affair which bears the name, "Over the Top." The paddle keeps the water in a long and winding indoor ditch moving just enough to carry swan-like boats past various war time scenes. Then by means of a cable these boats are drawn to the top of an incline from where they take the final "shoot the shoots."

One of the merry-go-rounds is run by a fifteen-horsepower Western Electric motor and the other, which bears the name of "The American Derby," is carried round by a seventy-five horsepower one of General Electric make.

The most thrilling affair on the grounds is the Airship concession, the tower of which is shown in the small illustration above. Airships suspended on long arms from this tower whirl round and round at a terrific rate, far above everything else in the park. Several motors are used in operating this concession, six of which are three-phase, 220-volt non-standard make. A fifteen-hoursepower, direct current, 500-volt Fairbanks-Morse motor is also used. This is a remnant of the earlier days when a number of these motors were obtained from St. Louis. It is a long remembered and significant fact in the park's history that every one of these motors had to be rewound within a year while the standard motors which have been used are still doing good work after twenty years' service.

Purifying the Swimming Tank —

The water from the swimming tank is being continually filtered under the supervision of the State Board of Health. The water runs out of the tank and into the filter house by the force of gravity. In the filter tanks it passes through three grades of gravel and is then pumped through big pipes back into the tank. Two fifteen-horsepower motors do this work. As the water passes out of the filter house, drops of chloride gas are injected into the stream at the rate of ten to the minute. This treatment with the addition of alum renders the water free from all germs so that scientific tests show that

The scenic boat ride which is the feature of the "Over the Top" concession shown here is made possible by a large paddle-wheel operated by an electric motor. The new American Derby merry-go-round is shown in the foreground.

it is a great deal purer than drinking water. The filters are cleaned twice a day by shutting off the water from the tank and turning in water from the bottom so that all sediment is washed to the top of the filter tank and taken off.

The man in charge of this filter is required to keep a log book which tells exactly when the filters are started, how much chlorine gas and alum are used and how often the filter tanks are cleaned. The water is tested by the state authorities every day.

Early Power Supply —

When Idora Park was first built it received its entire power supply from the street car line which runs past the grounds. This unique condition was true because the park was started and is owned by the traction company and power could be furnished more cheaply and easily in this way. At this time the direct current entered the park at 500 volts. One of the annoying features of the arrangement was the occasional fifty per cent reduction of the power supply whenever a street car passed by.

Lighting the Park —

In accordance with the original direct current supply the first lamps for lighting the park were strung in series of five. The original wiring in the buildings was open knob and tube, but now this has been changed so that all buildings are equipped according to the underwriters specifications.

A tower of twelve Western Electric Davis flood lights on the top of the central building really does the practical work of illuminating the park grounds. When all other lamps in the park are turned off, it is found that these twelve 1000-watt lamps illuminate the entire park. The electrician states that twenty-four more of these flood lamps will be added to the tower next year.

An 18-inch searchlight with a seven-mile range is the crowning glory of the tower. Few searchlights have as elaborate a history as this one. It was taken from a Spanish man-of-war which was sunk by Dewey in Manila Bay and was sold to Idora Park as salvage a few years ago. Being part of the equipment of the Spanish government the searchlight was of course manufactured in Germany. A 100-volt direct current generator and a twenty-five horsepower motor are the equipment necessary to operate this searchlight.

A most festive appearance has been given to the park by coloring the lamps which outline the buildings red, green and amber. These lamps, some of which have been in use for the past fifteen years, are eight candlepower carbon lamps, 220 volts. These are more durable and consume less current than the regular lamps and because they are used more for show than for actual illumination purposes, the park continues to use these eight candlepower carbon lamps and announces that it is always an open market for as many of them as it can secure.

Thus the story of the amusement park electrician extends from one end of the grounds to the other and into every nook and corner. Every pleasure-giving arrangement, from the most thrilling roller coaster to the delicious hot dog is made possible through the use of electricity in this, its fascinating fun-making capacity.

Mechanical Analogs in Alternating Currents

BY G. R. SHUCK

(A comparison between an electrical cycle of operations and a corresponding mechanical process frequently does much to clarify the latter. A number of analogs of this type, of which the following is the first, have been prepared by a member of the electrical engineering staff of the University of Washington, and will appear serially in these columns.—The Editor.)

Practically all electrical phenomena may be duplicated in certain mechanical mechanisms, and the operation of the latter can more easily be understood than the unseen forces at work in electrical apparatus. Some of the fundamental laws of alternating currents may by this means be more clearly shown to those who are not satisfied with the conception gained by mathematical formulæ alone.

The Condenser

In the system shown in Fig. 1, C is a cylindrical chamber divided into two equal parts, A and B, by an elastic membrane, M, such as rubber. The pipes P and P_1 through valves V and V_1 lead to two pressure tanks. The pipe P_2 containing valve V_2 connects the two sides of the chamber together, as shown in the figure. The whole system including only half the tanks is filled with some incompressible fluid without appreciable weight. The tank, T, is subjected to some pressure, say thirty pounds per square inch, and tank T_1 some lower pressure, say ten pounds per square inch, by means of some compressible gas such as air.

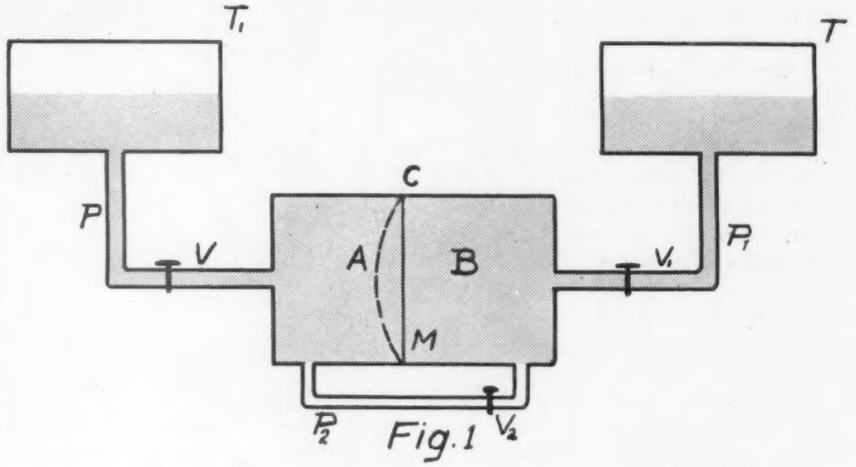


Diagram illustrating the mechanical parallel of the operation of an electrical condenser.

When valves V and V_1 are opened, a pressure of twenty pounds is exerted upon the elastic membrane M, which, under the strain of pressure, will be distorted into the shape shown by the dotted line, causing a momentary flow of the fluid into B and out of A; the amount of flow depending upon the amount which the membrane M will stretch, and the amount of pressure exerted on it. Upon closing valves V and V_1 there will still exist the difference of pressure between the two halves of the vessel, and the membrane M will remain distorted. If the valve V is now opened there will be a flow of fluid from chamber B to A, until there is no difference of pressure between the two chambers and the membrane will return to its original unstrained position.

In the system shown in Fig. 2, A and B are two

metallic plates separated by some insulator, such as rubber, air, or paper. The conductors W and W_1, through switches S and S_1, lead to the terminals of a storage battery, and W_2 and W_3 connect a resistance R across the two plates through the switch S_2 as shown in the figure. When the switches S and S_1 are closed the electrical pressure of the battery is exerted between the two plates, the insulating material between the two plates receives a charge of electricity, causing a momentary flow of current through the conductors W and W_1, the amount depending on the character of the insulating material and the electric pressure exerted upon it. Upon opening switches S and S_1, there will still exist the difference of pressure between the two plates, and

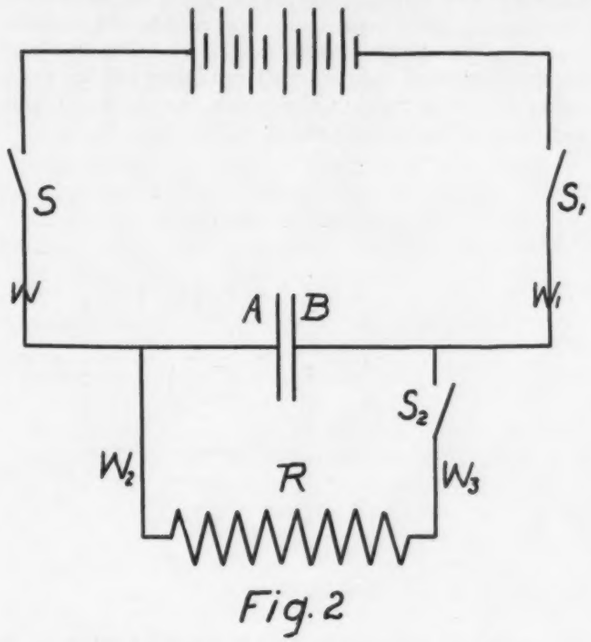


Fig. 2

Diagram illustrating the cycle of operations in a condenser

the insulating material will remain charged and under electric stress. If the switch S_2 is now closed, there will be a flow of electricity through the resistance R until there exists no difference of electrical pressure between the two plates, and no electric stress in the insulating material.

The foregoing cycle of operations shows in a general way the similarity of the two systems; the one, a mechanical mechanism following the laws of mechanics; the other, an electrical mechanism, called a condenser, following the laws of electric circuits. A more detailed comparison will show more clearly all the characteristics of a condenser and its behavior.

1. The two tanks supply mechanical pressure measured in pounds per square inch, analogous to the storage battery supplying electrical pressure in volts.

2. The two halves A and B of the cylindrical vessel are analogous to the two plates A and B of the condenser.

3. The membrane M, separating A and B, is analogous to the insulating material between the plates, and is called the dielectric.

4. The quantity of fluid which flows through the pipes P and P_1 is proportional to four conditions: (1) the capability of the membrane to stretch under pressure, (2) the amount of pressure applied, (3) the thickness of the membrane, (4) the area of the membrane.

Let K = a measure of the capability of the membrane to stretch
t = the thickness of the membrane
s = the area of the membrane
e = the pressure per unit area on the membrane.

The quantity of fluid flowing through the pipe is proportional to $\frac{\text{e.k.s.}}{\text{t}}$. The term $\frac{\text{k.s.}}{\text{t}}$ is a quantity proportional to the ability or capability of the membrane M to be stretched by given pressure. The quantity of electricity which flows through the conductors W and W_1 is also dependent upon four conditions: (1) the electrical permeability of the dielectric which varies with different materials, called specific inductive capacity, (2) the amount of electrical pressure applied, (3) the thickness of the dielectric, (4) the area of the dielectric or one of the plates.

Let K = the specific inductive capacity $\times$ .08842 $\times 10^{-6}$
t = the thickness of the dielectric in centimeters
s = the area of the dielectric, or one of the plates in square cm.
e = the electromotive force in volts
c = the capacity of the condenser in micro farads

The quantity of electricity in coulombs =

$$\frac{\text{k.s}}{\text{t}} \times \text{e} \times 10^{-6} = \text{c} \times \text{e} \times 10^{-6}.$$

The quantity $\frac{\text{k.s}}{\text{t}}$ is the capacity (c) of the condenser expressed in micro farads, and is the measure of the capability of the condenser to retain a charge of electricity at a given pressure. In mechanics the coefficient of elasticity is a measure of the pressure applied to produce a given distortion. Hence the reciprocal of the coefficient of elasticity is a measure of the amount a substance will be distorted under a given pressure, and bears the same relation in mechanics as does specific inductive capacity in electric circuits. Consequently the coefficient of elasticity in mechanics bears the same relation as does specific elastance of a substance in electric circuits.

COOKING BY ELECTRICITY

The extent to which the development of the electrical home will increase the business of the power company is shown in the announcement which accompanied the recent hearing of the Bay Point Light and Power Company's application to increase its rates.

At this time W. S. Van Winkle, president of the company, testified before the California State Railroad Commission that ten per cent of the company's gross revenue was derived from the sale of electric energy for cooking purposes. The company which operates in the towns of Bay Point and Clyde, Contra Costa county, is very much in favor of the electric cooking idea and is proud to state that this is the greatest revenue percentage from cooking on record. This goes to show that the housekeepers of the West are keeping pace with the men of industry in applying electricity to every phase of home and business life.

Steam Power Plant Tests—III.

BY H. L. DOOLITTLE

(Following is the third and last instalment of data compiled from a number of important tests made at a large steam power plant. The author is steam power plant specialist with the Southern California Edison Company.—The Editor.)

Ratio of Oil and Steam Pressures —

A short run was made to determine the effect of varying steam pressure on the steam and oil pressures at the burner. Pressure gauges were installed on the burner side of the regulating valves so as to give the actual pressure of the oil and steam at the burner tip.

The accompanying chart shows the results of simultaneous readings of the pressures on the steam and oil headers and also the pressures of the steam and oil at the burner. During this test the steam header pressure was varied while all other regulating valves were left unchanged. These curves show very clearly that with an inside mixing burner, such as the Hammel, the oil pressure at the burner is affected to a great extent by any change in the steam pressure.

The boiler test made on 1/4/15 consisted of three runs made with different ratios of steam and oil header pressures. These pressures on steam and oil headers were respectively, 148 lb., 50 lb.; 122 lb., 41 lb.; 102 lb., 41 lb. The combustion during these tests appeared to be practically constant as the CO_2 varied only .32%. There was also very little difference noted in the boiler efficiency showing that variation in oil and steam pressure ratios, within certain limits, have practically no effect on efficiency.

Radiation Test —

On 3/24/15 a six-hour run was made to determine the amount of oil required to keep up full steam pressure with the boiler cut off of the header. In this test a small burner having an oil slot $\frac{3}{8}$-in. wide was used. This burner was operated at intervals as required to keep the boiler pressure within the limits of 199 to 212 lb. It was required to operate the burner a total of 2 hours and 57 minutes out of the six hours and there was used 223 lb. of oil or an average of 37 lb. of oil per hour. This, therefore, represents the radiation losses on boilers kept up to header pressure but not delivering any steam. It is evident that the radiation loss would be somewhat greater than this with the boiler operating under normal conditions on account of the higher furnace temperature.

Swinging Load —

On 3/18/15 a seven-hour test was made on one boiler to determine the efficiency of a fluctuating load.

During this test the load varied from approximately 90% to 140% of rating and for 42 minutes during the noon hour the fires were shut down completely. The results of this swinging load test show that the boiler efficiency was approximately 8% lower than the combined efficiency of boiler and economizer, and approximately 6% lower than the corresponding efficiency obtained under normal operation.

Starting Up Cold —

In order to determine the amount of oil required to bring a cold boiler up to header pressure, a run was made on 1/13/15 on a boiler that had been shut down for 48 hours.

The water in this boiler just before the test was at a temperature of 148°. The boiler was brought up to header pressure in 62 minutes after the time of starting and during the period 1,497 lb. of oil, or 190 gallons, were burned. It was also noted that the water in the gauge glass rose 7½ in. from the time of starting until the time of obtaining header pressure. The pressure in the boiler started to rise 25 minutes after the beginning of the test.

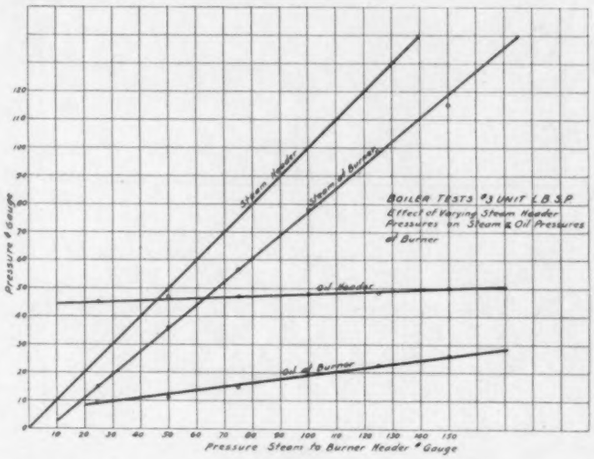


Chart showing the results of simultaneous readings of the pressures on the steam and oil headers and also the pressures of the steam and oil at the burners.

Hot Water to Economizers —

In this test it was endeavored to show the effect of hot water entering the economizer on the rise of temperature of the feed water in the economizer. The average temperature rise in the feed water through the economizer was 80°. Although the temperature rise to the economizer was not found to vary with the load on the boiler in any regular manner, the rise obtained during this test appears to be lower than that which would be obtained under normal conditions.

Test of No. 1 and No. 2 Units

In the test of the No. 1 and No. 2 units, the 15-ton platform scales were used to weigh the water supplied to the boilers. As there was only one set of scales available, the Worthington water-weighers had to be relied upon to measure the condensate returned from the turbines. In this way it was intended to obtain the steam used by the steam driven auxiliaries by subtraction, the make-up water and condensate from the total water fed to the boilers.

However, as before stated, it was found that the water weighers gave very unreliable results although they were calibrated before the test was made, consequently it was impossible to determine either the auxiliary steam or the water rates of the turbine with any reasonable degree of accuracy. The figures for condensate, make-up water and steam from auxiliaries on the data sheets have therefore been questioned as these quantities were obtained from the meter readings.

Problem Course in Electricity

BY H. H. BLISS

(The working out of a practical problem does more to fix an electrical law in the mind than prolonged theoretical reading. The following article, the third of the series by the supervisor of the department of vocational education of Nevada, takes up voltage drop and other characteristics of series circuits, and concludes with a number of practical problems involving a use of the principles discussed.—The Editor.)

SERIES CIRCUITS

Three Special Laws.—In solving problems related to circuits in which the same current goes through several parts in succession we must keep clearly in mind the three forms of Ohm's Law as well as the three special laws of simple series circuits: (1) The number of amperes at any instant is the same in every part of the circuit; (2) The resistance of a series circuit is equal to the sum of the resistances of the several parts; (3) The pressure applied to a series circuit is equal to the sum of the voltages across the several parts. Note also that Ohm's Law applies to the circuit as a whole: Volts applied to circuit = amperes $\times$ total ohms.

As an example of this sort of circuit, take the connection of a telephone transmitter in a "local battery set." (The instrument, shown in Fig. A, has a variable resistance, for when sound waves shake the flat plate behind the mouthpiece the carbon grains in the box at the rear are alternately pressed and released. Carbon has the peculiar property of greatly lowering in contact resistance when the surfaces of the granules are squeezed together.) The transmitter is connected through three wires and a coil to a 3-volt battery (2 dry cells).

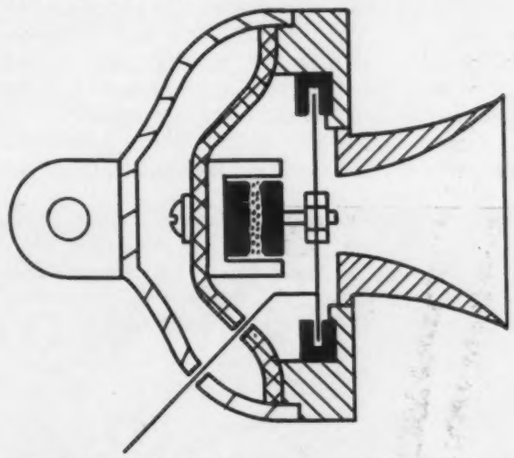


Figure A. A diagram showing the connection of a telephone transmitter in a "local battery set."

Assuming that the coil has 1.1 ohms resistance and each of the three wires .1 ohm, what is the resistance to which the battery voltage is applied when the transmitter has 40 ohms? What current flows in the coil? in the transmitter? What pressure is applied to the coil? Adding resistances, .3 + 1.1 + 40 = **41.4 ohms**; current = 3/41.4 = **.0724 ampere.** This is the current at that instant in the transmitter and also in the coil, for they are in series. The pressure across the coil is .0724 $\times$ 1.1 = **.0796 volt.**

Other Examples.—A 21 candle power automobile lamp is built to take 3.5 amperes from a 6 volt battery. If it is desired to operate this lamp on a 112 volt house lighting circuit, what resistance must be inserted in series? Lamp resistance = 6/3.5 = 1.7 ohms. Total resistance needed = 112/3.5 = 32 ohms. As a check on the work, note that the voltage across the lamp = 3.5 $\times$ 1.7 = 6; that across the resistance = 3.5 $\times$ 30.3 = 106; adding these voltages we get 112.

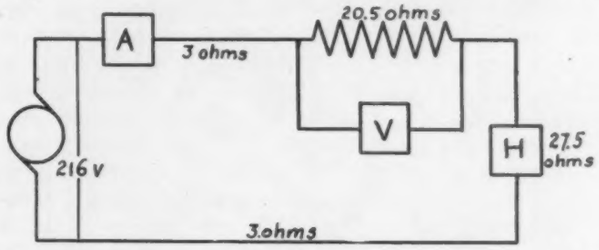


Figure B. A diagram of a 216-volt generator which sends current through two line wires of 3 ohms each, a resistance of 20.5 ohms, and a heater of 27.5 ohms.

The 216 volt generator in Fig. B sends current through two line wires of 3 ohms each, a resistance of 20.5 ohms, and a heater of 27.5 ohms. Find the reading of the voltmeter, V. The circuit resistance is 54 ohms, and hence the current = 216/54 = 4 amperes; the pressure needed to force 4 amperes through 20.5 ahms is 82 **volts,** which is the reading of the meter.

For street car lighting the voltage used is generally 550, and hence five 110 volt lamps are connected in series in each lighting circuit. If each has 500 ohms, the current is 550/2500 $\times$ .22 ampere. If now one lamp is replaced by one of higher candlepower which normally takes 1.34 amperes at 110 volts, what current will flow and how will the voltage be distributed? The new lamp has 110/1.34 = 82 ohms; total for the circuit = 82 + 4 $\times$ 500 = 2082. Current = 550/2082 = **.264 ampere.** Voltage across the new lamp = .264 $\times$ 82 = **21.7**; across each of the others it is .264 $\times$ 500 = **132 volts.** The four lamps will quickly burn out, and the new lamp will in the meanwhile give practically no light. A com-

plete check on the solution is obtained by adding the voltages: $21.7 + 4 \times 132 = 550$ —.

Drop in Pressure.—Imagine a long horizontal line of pipe full of water, with a pump trying to force water in at one end (call it end A) and a closed valve at the other end (B). A simple test with pressure gages or manometers shows that the water pressure is exactly equal at A and B as long as no water flows. But if the valve at B is opened a little, the pressure gage there immediately reads lower than the gage at A. There is a "pressure drop" along the pipe due to the flow of water. If the flow increases the "drop" becomes greater, that is, the difference between the pressures at A and B depends upon the rate of flow of the water.

In an analogous way the voltage between a trolley wire and the track is exactly the same at the far end of the line as the power house, so long as no current flows. But as soon as current starts in the line, the pressure at the distant point drops below the generator voltage, and the amount of the drop is proportional to the number of amperes.

This is readily understood by referring to Fig. B. When 4 amperes flow it must take 12 volts to drive the current through one line wire ($4 \times 3 = 12$), 82 volts to drive it through the resistance coil, 110 volts to drive it through the heater, and 12 more for the return wire. The sum of these figures is 216, the generator voltage. Obviously if 24 volts are required to get the current through the line, the pressure across the load (heater and coil) is 24 volts lower than that at the generator.

If the resistance coil is removed and the upper wire connected to the heater, the total resistance becomes 33.5 ohms and the current 6.45 amperes. The drop in the line becomes 6.45×6 ohms $= 38.7$ volts, leaving only 177.3 at the load.

Rule: The line drop (or difference between voltage at generator and that at load) = amperes $\times$ total line resistance (both wires).

Example.—The motors of an interurban train take different amounts of current, depending upon the speed, gradient, etc. If the voltage at the power house is 1230, the resistance of the trolley wire 1.2 ohms, and that of the track .6 ohm, what is the voltage at the train when it takes 0 amperes? 20 amperes? 70 amperes? Line drop $= 1.8 \times$ current, or 0, 36 and 126 volts in the three cases, leaving train voltage **1230, 1194** and **1104 volts.**

Answers to Second Problem Set

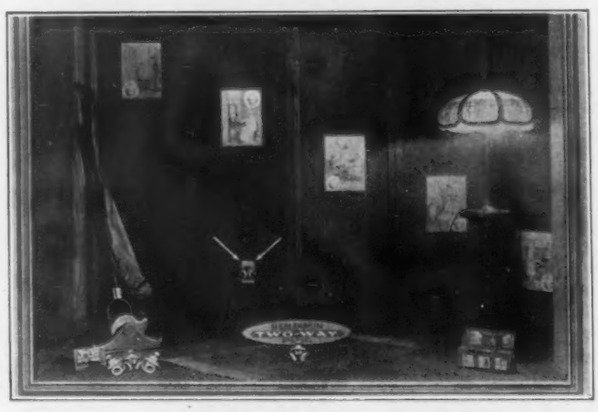
11. **60,000 ohms.**
12. (a) $9/.006 = 1500$ amperes; (b) (Deleted by Censor).
13. Amperes $\times$ ohms $= .0221$ volts $=$ **22.1 millivolts.**
14. $.040/.000032 =$ **1250 amperes.**
15. Resistance $= 108/.735 = 147$ ohms; $8.5 \times 147 =$ **1250 volts.**
16. The voltage was **at least 105 volts.**
17. Resistance $= 220 \div 1/4 = 880$ ohms. (Note that dividing by 1/4 is **not** the same as dividing by 4). $550/880 =$ **.625 ampere.**
18. **55 ohms; 80 ohms; 256 ohms.**
19. $240/.0062 =$ **38,700 ohms.**
20. If 3 gallons per second pass one point, the same amount must pass every other point in the same time, or else there would be an accumulation or a deficiency of water somewhere in the circuit. Hence the answer is **"Yes."**
21. **30** and **32 volts.**
22. **13.4** and **14.3 mil-amperes.**

Third Problem Set

23. No. 30 copper wire is listed as having 103 ohms per thousand feet. What is the resistance of one foot? of 670 ft.?
24. Fifty lamps are connected in series. One takes 6.6 amperes; what does the next one take? The pressure across each lamp is 37 volts and the current leaves the substation at 1880 volts. What is the resistance of the line and of each lamp?
25. What are the "ohms per thousand ft." of a wire in which there is a drop of 4 volts when 8.7 amperes flow through a piece 230 ft. long?
26. The safe current for a certain piece of apparatus of 8.5 ohms resistance is 6.7 amperes. What must be done if it is to be used on a 215 volt line?
27. A certain house is supplied with lighting current at 218 volts. It is desired to use 110 volt lamps, as they last better than 220 volt lamps. Hence at each outlet two sockets are connected in series. What is the result of using a 202 ohm, 110 volt, lamp in one socket and a 475 volt lamp in the other? (Find current and voltage for each lamp.)
28. The voltage at a certain distribution center was 112.82; in a nearby house where a current of 7.3 amperes was being used the pressure was 109.5 volts. Find the resistance of each of the wires.
29. If a 550 volt motor takes 67.2 amperes, how far is it away from a 600 volt generator if each of the line wires has .248 ohm per thousand ft.?
30. A mine locomotive operates in a tunnel 700 ft. underground. The trolley wire has .05 ohm per 1000 ft.; the track .01 ohm per 1000 ft.; the wire used to carry the current down the shaft has .02 ohm per 1000 ft. The ammeter and voltmeter readings at the train when it is 1600 ft. from the shaft are 130 and 214 respectively. What is the voltage at the generator at the top of the shaft?
31. A man whose body resistance was 5000 ohms got himself into a circuit to which 115.5 volts was applied. He expected to be "protected" from a severe shock because he was in series with two lamps of 250 ohms each. Find the drop in the lamps and the voltage applied to the man.
32. A generating station is located at a distance from the center of a town, where it is desired that the lighting voltage be kept constant at 116. The operator is instructed to make the generator pressure 120 volts when the load is 140 amperes. What is the resistance of the line, and what should be the generator voltage for loads of 30 and 200 amperes?

Western Ideas

THE VISITING DEALER can be greatly helped by the manufacturing company in planning his window displays. The picture below is a window which has been developed by the Dealers' Help Department of the Benjamin Electric Manufacturing Company. It is on exhibition at the company's executive offices in Chicago, and is one of a series of exhibits being prepared for the benefit of visiting dealers.



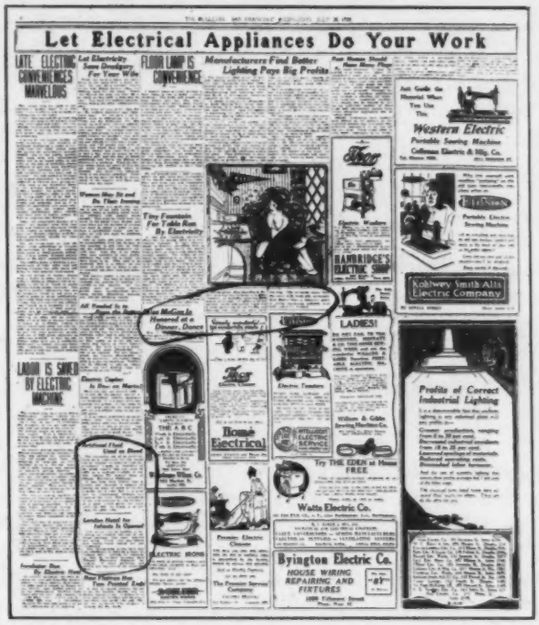
This is a demonstration of the simplicity and ease with which a really attractive window can be developed from the material furnished to dealers by the company. The use of the double way convenience outlet is shown here to great advantage.

Advertising

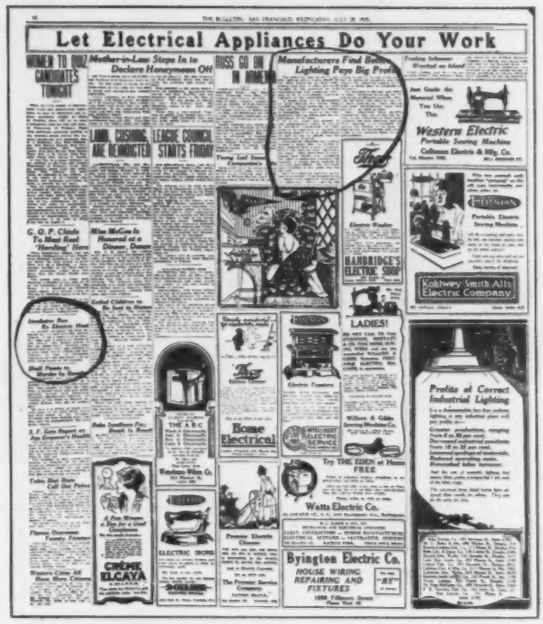
BY HOWARD W. ANGUS

(Which advertising medium reaches the greatest number of prospective buyers? In the following article, the second of a series on advertising, the secretary of the California Electrical Cooperative Campaign takes up the special advantages of newspaper advertising and the way in which it should be handled.—The Editor.)

Newspaper advertising has been called the heart of the retail business. Certainly it is one of the most important, if not the most important medium of advertising for the contractor and dealer. Through the newspapers you can keep your name before practically all the people of your city all the time—a feat that can be accomplished in no other way. This medium at least must be used if you expect successfully to develop, and to expand into a position of prominence and influence in the retail merchandising world. Everybody owning a home, a store or a factory reads the newspapers. Probably you would like to know what effect an advertisement run in a newspaper has upon the people. We will suppose that you could make arrangements with the telephone company so that all of its subscribers in your city would be connected up with your desk for a minute every morning and that during that minute you had the privilege of telling these people anything that you wished about your business. Some of them would never hear their phone ring. Some would hang up the moment you began to speak. Others would wait to hear who was talking. Others would wait a little longer to hear your story. During the telling of your story from time to time those at the other end of the line would hang up. Some would listen to the whole story. How long you could get the majority of people to listen would depend on how your introductory remark caught their attention, and how much your remarks interested them. Whether the conversation resulted in buying action would depend entirely on how much of a desire you created in their minds for the goods you had to sell. Certainly if you repeated that process every morning you would get different people to listen through your story each day, with the result that in a month or two months' time everybody had at least heard your story. That is just what happens to an advertisement in the newspaper. Some never see it, of course. Some merely glance at it. Some read part of the written word. Others read it all. Some of these read it and buy. The more often the advertisement appears the more likely is everybody at some time or other to read and get your story, and the larger the number becomes of those who actually buy.



An example of an electrical page in a daily newspaper that has too much electrical news and not enough news of interest. Such a page would not attract the interest of the casual reader.



The same page as it appeared in a later edition of the paper. This page has a large amount of very interesting news but a minimum of electrical news.

Buying Customers

In a newspaper you are buying readers just as you were buying hearers in the assumed telephone conversation. So the first fact that you want to know about a newspaper is how many readers it has and the cost of reaching those readers. Suppose there are two papers in your city; one has 10,000 circulation and the other 25,000 circulation, and that the rate on the first paper is 25c. an inch, and on the other 50c. an inch. Everything else being equal, it is quite evident that the newspaper with the 25,000 circulation at 50c. an inch is giving you more for your money than the newspaper with the 10,000 circulation at 25c. an inch. The 25,000 circulation news-

paper is giving you 12,500 readers for 25c. as against 10,000 readers in the other paper.

However, another point should be taken into consideration, and that is how many readers of the newspaper are prospective buyers. We will again assume that the newspaper with the 10,000 circulation is entirely confined to the city in which your store is located, but that the circulation of the other newspaper covers a large territory and is distributed in many other towns which are adequately supplied by electrical stores. We will suppose further that the newspaper with the 25,000 circulation has a 10,000 circulation in your city and that the other

Electricity Big Labor Saver for Tired Housewife

POWER PROVING GREAT HELP IN REDUCING WORK

Washing Machines Washerwoman Uses Unseen Power

Curb Drudgery in Electricity Proves Great Help This Modern Time

Alan Kahles to Make Pilgrimage To Yellowstone

Power Cooking an Electrical Range Another Home Aid

LADIES!

Make Child's play of washing day - the FEDERAL ELECTRIC Way

Buy San Joaquin Power Prior Preferred Stock

Douglas Electric Co.

GELBER ELECTRICAL WORKS

Home Electrical

ROBERTS MANUFACTURING Co.

Another electrical page that has the proper amount of electrical news with good, interesting news items mixed in. Such a page will attract attention and the reader will read some of the electrical news and look over the advertisements.

15,000 goes into other cities. Then it is quite evident that the paper with the 10,000 circulation at 25c. an inch is a much better buy than the paper with the 25,000 circulation at 50c. an inch; for in that case you are buying 10,000 possible purchasers in each newspaper.

Another point that should be taken into consideration is the character of the circulation of the newspaper. In large cities several editions are printed; some of these go into the home and some are sold on the street. The street circulation as a general rule, with the exception of the edition that appears on the street about 5 o'clock, when people are on their way home, never reaches the home and, therefore, is not so valuable to the electrical contractor and dealer. What you are interested in is the number of newspapers that are delivered at the home, and the street editions that are carried home.

You will find such facts as these in what is known as the A B C report or the sworn detailed circulation. The A B C report gives just where, when and how the newspaper is delivered. This report is made by the national Audit Bureau of Circulation for the information of national advertisers who are spending millions yearly. It pays them to know. It will pay you. You should know what you are buying in newspaper space as well as in goods. Newspaper space is sold just the same as merchandising is, and quantity purchases bring their discount. By laying out your advertising program in advance and signing a contract for the amount you should use, and intend to use during the year, you can save as much as 20%. Lay out your advertising program, study the rates, and buy your space like a business man.

I do not want you to gain the impression that you are only to use one newspaper. You should use all if possible, because what you want is 100% saturation in your city if possible. Two newspapers will do that better than one and three better than two. In large cities where there are four newspapers and it is impossible for a dealer to use all of them, there are three crosses that can be used with success. First, the newspapers can be divided into the morning and afternoon fields. By using the two morning papers you are safe in believing that approximately 75% of the home circulation will reach the homes. By using the afternoon field you are also sure of the same result. Another cross that is very successful is that consisting of one morning newspaper and one afternoon newspaper. In this you are subject to some duplication, but you are appealing to the readers of both fields and catching them both in the morning and in the evening.

Persistence and Profit

Having made your appropriation and picked your newspaper, the next decision which you should come to is to do a thorough job. Unless you are going to advertise in the newspapers consistently and persistently, you might just as well save your money. Spasmodic advertising—by that I mean such advertising as once a month or only during one month of the year—is not a wise expenditure of money. Advertising experts will advise you that approximately 5% of the readers of any one edition of the newspaper will see your advertisement. That is not very many, and that is why spasmodic advertising is foolish. But if you advertise at least once a week, the 5% will consist of different people each time who read your advertisement; experience has shown that the number who read it increases, so that before a year's time you have secured 100% saturation. That is why people say that advertising must be persistent, that its effect is cumulative, and that the results of advertising can only be judged by looking at your trial balance sheet at the end of each year. You are selling electric appliances and wiring 365 days in the year. You would not think of keeping your store open only one month of the year or during one day in the month.

By advertising year in and year out your store will become better known and patronized by more people. The best known store is invariably the best advertised store. Department stores also had small beginnings. They did not spring up full grown over

night. One thing that every successful department store has done is this—it has advertised and then advertised some more.

An Intelligent Plan

Advertising should be built according to a plan, just like a home. While you should advertise every month, there are some months when you should do more advertising than in the others. In California there are certain well defined months in which your advertising should be heaviest. Beyond a question of a doubt October, November and December are the months when you should use the most advertising space, leading up to your Christmas campaign. It would not be a mistake to use twice as much advertising space during those three months as during any other three months of the year. The other months that seem to call for a larger advertising display are April, May and June of the Spring campaign. So in laying out your newspaper advertising appropriation for the year, be sure and allow for large advertising during October, November, December, and increased advertising during April, May and June.

At the first of each year you should think out and form your advertising schedule. This should not be a hard and fast schedule but one that may be departed from as occasion arises. To give a better idea of what I mean by schedule, I will quote the merchandising advertising schedule prepared by the National Electric Light Association:

January—Clearance Sale.
February—Heating Pads.
March—Vacuum Cleaners.
April—Sewing Machines and Sewing Machine Motors.
May—Grills.
June—Irons.
July—Fans.
August—Clearance Sale.
September—Washing Machines.
October—Radiant Heaters.
November—Toasters.
December—Electrical Christmas Gifts.

Don't think that you should necessarily use this schedule; certainly a contractor would not. It is given as a suggestion and a basis to start from in working out your schedule. Certainly you should write to your jobbers and manufacturers and secure from them their national advertising schedule. By tying-in with them you gain the benefits of having all the people in your town who subscribe to such magazines as the Saturday Evening Post or the Ladies' Home Journal, read in those magazines about the goods you sell, and pick up the daily newspaper and find out that these articles can be purchased in their own city at your store. That makes advertising like hunting with a double-barrel shotgun instead of with a rifle.

COMING CONVENTIONS

Northwest Electric Light and Power Association—
Spokane, Washington, September 8-11

State Chapters of the American Association of Engineers—
Everett, Washington, August 24

National Association of Electrical Contractors and Dealers—
Baltimore, Maryland, October 4-9

MOTHERS, "KIDS" AND ELECTRIC CLOTHES WASHERS

BY GERALD F. CHAMP

It has often been said that the quickest way to reach the heart of a man is through his stomach and it is a proven fact that one of the surest ways of interesting mothers is by enlisting the aid of their little ones. Taking the last fact as its cue the Southern Electrical Company, of San Diego, California, conceived an electric clothes washer advertising feature that has proved itself not only a good publicity stunt but a splendid prospect getter as well.

The Blue Bird and Eden electric clothes washer Miniature Model contest featured by the concern from March 30th to April 14th was open to any boy or girl under 16 years of age residing in San Diego county.

The object of the contest was to interest the children in making miniature models of the store's two most popular and best known makes of electric clothes washers. The models to be any size between four and twenty inches high and of any material the maker might see fit to use. Models to be solid or hollow. Although it was not expected that working models be submitted several very well executed models of this nature were made and the perfection was commendable indeed.

The basis of scoring the contest was fifty points for correct scale dimensions and fifty points for correct general appearance, covering lettering, finish, and color.

A 4-column by 13-inch announcement was run by the store in the three local papers, along with a free news story, giving complete details and rules of the contest. This announcement was followed several days later by another smaller advertisement calling attention to the closing date of the contest.

Of course the outstanding feature of the stunt is that it introduces the electric clothes washers sold by the concern featuring the contest in homes that would have been difficult to reach through any ordinary sales plan.

In fact, many women visited the Southern Electrical Company to see the machines, and told the clerks that they came as the direct result of their children's participation in the contest, saying that they had never been interested in electric clothes washers before. Several hundred boys and girls inquired at the stores for pictures to work from and other information. This afforded a splendid method of introducing literature into the homes and doubtless there was plenty of washing machine discussion as the direct result.

As soon as the models were completed and brought to the stores they were immediately put on display in the windows and the comments heard from passers-by were worth the value of the prizes offered for the contest.

Many excellent prospects were secured that have since been turned into sales and as said before, the advertising value of the contest was well worth a great deal more than the value of the prizes. It's a stunt that will be profitable to any electrical concern.

SPARKS—Current Facts, Figures and Fancy

(The sea is harnessed for the production of electrical energy; houses are built of tin cans; explosives are used in agriculture and radium will put you to sleep. These startling facts and others like them are explained on the following page along with items which tell of the growing motion picture industry of Italy, the harnessing of French waterfalls and the surprisingly high cost of running an automobile.—The Editor.)

Ten cent street car fares are now being paid in fifty-nine cities in the United States. Recent tabulation shows that increased fares have been granted in 460 cities.

* * *

Tin can houses are becoming the style in a section of Montenegro. The natives have found that old gasoline containers and tomato cans flattened out make very good fireproof houses.

* * *

Showing that America is as popular as ever with the rest of the world, recent immigration statistics state that immigrants are arriving in this country at the rate of about 10,000 a week.

* * *

A reform in the production methods of the tea industry is being instigated by the government of China. A tea bureau has been established and a tea college is to be founded. All this is largely because of the fact that India and Ceylon have captured nearly all of China's tea trade.

* * *

A system of three waterfalls in the Valley of the Ossau, France, is being harnessed in order to obtain water power for the electrification of the Chemin de Fer du Midi. The cost of the work is estimated at 100,000,000 francs, and the project will be completed within five years.

* * *

The question, What does it cost you to run your automobile? has been answered by a recent compilation made from carefully kept records of over 300 cars. The answer is that the present cost of operation, not allowing anything for overhead, depreciation or replacing, is 7.1 cents per mile.

* * *

Tunnel commutation will soon become the fad among Pittsburgh workers when the twin tunnels, each 5,700 feet long, through the range of hills bordering the Monongahela River valley, are completed. Thousands of workers who live in the southern part of Allegheny county will make use of these tunnels daily.

* * *

We with our modern bank notes are not so far ahead of the ancients, after all, for the first piece of paper money was issued in China 1269 years ago when America was a wilderness. The note is more than a foot long and bears the arrogant inscription, "Circulating forever and ever." The colors are still bright and the gold ink as shiny as the day it was applied.

The discovery that certain large deposits of lignite or immature coal in Devonshire, England, can be used as a smokeless fuel will make it possible to generate electric power at an unusually low cost. A $5,000,000 copper refinery is to be set up on a site where the requisite electrical energy can be generated from deposits of 800 million tons of lignite.

* * *

Reminding us that it is an ill wind that blows nobody good, Italy is planning to dispose of her surplus supply of explosives in preparing her land for large scale agricultural projects. In addition to preparing the land for cultivation, it is claimed that the use of certain explosives destroys parasites and to a certain extent reduces the necessity for fertilization.

* * *

People in Germany are being put to sleep through the aid of a Radium Sleep Button, at least a high class German periodical is advertising a contrivance which is nothing more than an ordinary "Radiolite" button upon which the owner is supposed to gaze until hypnotized when he falls sound alseep. It has been further suggested that those who have not a Radiolite button try using their watch for this purposes if it happens to have its hands coated with radium paint.

* * *

Even the sea is to be harnessed for the production of electrical energy, according to reports which come from the west coast of England. Here a number of estuaries have been surveyed with a view to installing turbines which work by the tidal ebb and flow. The tide makes the power at both its inflow and its outflow, only ceasing for a comparatively short time during the period of half tide. In certain districts the great variation in the hour of the tide at neighboring estuaries makes possible the production of maximum energy during an almost continuous period.

* * *

The United States of course claims first place among the nations of the world in the manufacture of motion pictures, but Italy is taking her place as a very close second. An idea of the importance of this industry in the economic life of the country can be derived from the fact that the working capital employed is now estimated at 300,000,000 lire and the actual capital invested at 100,000,000 lire. There are 82 companies engaged in the production of films, of which the greater number are located at Rome, which naturally presents unusual advantages from the scenic standpoint. The annual production of new films in Italy has reached 1,600,000 meters, and if it is estimated that 40 copies are made from each negative the total of printed films is 64,000,000 meters.

PERSONALS

Franklin T. Griffith, president of the Portland Railway, Light and Power Company and for the past year chairman of the Water Power Development Committee of the National Electric Light Association, has been reappointed to that position. This reappointment goes to show that the value of the splendid work which has been done by Mr. Griffith during the past year is recognized. In connection with his work as chairman of this committee, Mr. Griffith is now in Washington, D. C., attending a conference of the national water power commission, created by recent act of Congress. The purpose of the conference is to consider regulations to govern the acquisition of water power rights and procedure to be followed in developing hydroelectric power properties. The commission is composed of the secretaries of war, agriculture and interior, and the Portland conferees are members of the National Electric Light Association committee specially created to meet with the federal commission.

Dave Harris, sales manager of the Pacific States Electric Company, has recently returned from the East where he attended the General Electric Company sales conference on Convention Island.

O. L. Le Fever has been appointed superintendent of the Northwestern Electric, at Portland, to fill the position made vacant by the promotion of Mr. Merwin, and **E. F. Pearson** has been made assistant to the superintendent.

L. T. Merwin, formerly general superintendent with the Northwestern Electric Company, has been made assistant general manager of the company and is at present acting as general manager in the absence of G. C. Pierce, general manager.

F. B. Tough, petroleum technologist, U. S. Bureau of Mines, in charge of the cooperative work being carried on by the Bureau with the Midwest Refining Company and the Ohio Oil Company in Wyoming, spent two weeks in California recently visiting the various oil fields and gathering data in connection with his work in Wyoming.

Earl Fisher, assistant manager of the commercial department of the Pacific Gas & Electric Company, has been appointed manager of this department. Mr. Fisher has always been very active in the commercial field, being chairman of the commercial section of the Pacific Coast Section of the National Electric Light Association.

Lee H. Newbert, manager of the commercial department of the Pacific Gas & Electric Company, has been appointed manager of the Alameda District. Mr. Newbert is the president of the Pacific Coast Section of the National Electric Light Association and chairman of the Advisory Committee of the California Electrical Cooperative Campaign.

W. A. Brackenridge, vice-president, Southern California Edison Company, **Franklin T. Griffith,** president, Portland Railway Light and Power Company, and **Guy W. Talbot,** president, Pacific Power and Light Company, have left for the East where they will attend a conference to assist in the formulation of a set of laws to carry out the purposes of the water power bill which has recently been signed by the President.

C. D. Slaughter, secretary of the Allied Industries, Inc., leaves on the fifteenth of August for Pawtucket, Rhode Island, where he will attend a sales conference of the Tubular Woven Fabric Company. Mr. Slaughter will also visit all of the other factories which his company represents on the Pacific Coast.

Frank A. Leach, manager of the Alameda District of the Pacific Gas & Electric Company, has been appointed assistant general manager of that company. Mr. Leach has been manager of the Alameda District since 1904, at which time it merely embraced the cities of Oakland, Alameda and Berkeley. The district now covers three counties, being the largest of all Pacific Gas & Electric Company districts.

J. C. Hoyt, hydraulic engineer in charge of the surface water department of the U. S. Geological Survey, who was in Salt Lake City recently on an inspection trip, predicted a big development in water power to the great advantage of the West. Almost unlimited possibilities are to be found in the West, he said, and with this development the public would turn more to the use of electricity, and other methods of obtaining power which would ultimately supplant the use of steam.

W. E. Blodgett, secretary-treasurer of the Utah Light & Traction Company, has been appointed comptroller of the Winnipeg Electric Railway Company of Winnipeg, Manitoba, Canada. This is one of the largest street railway systems in Canada, and Mr. Blodgett's position is one of the most important in the company. Mr. Blodgett has had long experience with the Utah Light & Traction Company and other companies, and is also naturally well equipped with ability in street railway accounting.

Wigginton E. Creed has been elected to succeed Frank G. Drum as president of the Pacific Gas & Electric Company, the latter having resigned on account of the great amount of time demanded by the various interests in his charge. Mr. Drum has been president of the Pacific Gas & Electric Company since 1905 when it was known as the California Gas and Electric Corporation. Mr. Creed, who succeeds Mr. Drum, is the attorney president of the Hooper Lumber Company and is interested in the East Bay Water Company of Oakland. He also formed the Columbia Steel Company of Pittsburg, California. Shortly after Mr. Creed's appointment he was the guest of honor at a banquet at the Palace Hotel in San Francisco given by Mr. John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company to the board of directors, heads of departments and district managers of the company.

F. D. Fagan, formerly Pacific Coast sales manager of the General Electric Company and president of the California Industries Association, has been appointed vice-president of the Edison Storage Battery Company, with headquarters at Orange, New Jersey. He is leaving for the East on the fifteenth of August. Mr. Fagan, a native of California, has been with the General Electric Company for twelve years, having entered its employ as a solicitor in the lamp department. He has attracted attention through the plan he has originated of lecturing upon efficient and economic incandescent lighting in connection with his work, and also as founder of Edison day which is now observed annually throughout the country on October 21, the anniversary of the invention of the incandescent electric light by Edison.

Walter F. Price, architectural representative of the California Electrical Cooperative Campaign, has charge of the building of the electrical homes that are being built in Oakland, Sacramento and other towns in the state. Mr. Price has done excellent work in selling the electrical home idea to the architects and home builders and the electrical home that is being demonstrated in St. Francis Wood is a result of his work with Mason-McDuffie Company of San Francisco. Mr. Price is a graduate of the Van Der Naillen School of Engineering and for nine years was in the employ of the Pacific Telephone & Telegraph Company as engineer of outside telephone plants. He has been with the California Cooperative Campaign since February of this year and the good work being done by him is noticeable in the increased number of convenience outlets now being installed in the houses under construction.

Rudolph Van Norden, consulting engineer in San Francisco, has taken a business trip East.

A. B. Macbeth, vice-president of the Los Angeles Gas and Electric Company, was a business visitor in San Francisco lately.

W. E. Freeman has been appointed director of commercial training of the Westinghouse Electric & Manufacturing Company.

A. H. Kahn, purchasing agent of the Pacific States Electric Company, is visiting the Portland and Seattle offices of his company.

J. O. Case, local sales manager, General Electric Company, Los Angeles, was in San Francisco lately to attend to a business conference.

D. A. Lyon, supervisor of stations, U. S. Bureau of Mines, has recently visited the San Francisco and Berkeley offices of the Bureau.

P. H. Booth, Pacific Coast sales manager, Edison Electric Appliance Company, has returned to the Coast after spending some time at the Chicago office.

R. W. Conlisk, illumination engineer, Westinghouse Electric & Manufacturing Company, has returned to San Francisco from the company's lamp works.

George K. Weeks has resigned from the board of directors of the Pacific Gas & Electric Company. This resignation was made in order to make place for the new president of the company.

Fred Todd, sales manager of the Portland office of the Pacific States Electric Company, has just returned from a business and pleasure trip to California, having driven down in his car.

L. R. Ardouin, lately secretary of the San Francisco Association of Electrical Contractors and Dealers, is now with the United States Steel Products Company with headquarters in San Francisco.

G. C. Pierce, vice-president and general manager of the Northwestern Electric Company at Portland, is away on a leave of absence to be at the bedside of his wife in southern California, who is quite ill.

A. V. Kipp, general agent, freight and passenger departments for the Oregon Short Line at Butte, has been appointed general freight and passenger agent for the Orem Electric lines at Salt Lake City. Mr. Kip has had about twenty years' experience in the railroad business, having started with the Union Pacific at Denver twenty years ago as traveling freight agent.

N. Sigimura, electrical engineer of Tokio, and **S. Kobori**, mechanical engineer of the same city, have been touring the United States studying the latest developments in hydroelectric construction methods.

Gilbert H. Grosvenor of Washington, D. C., president of the National Geographic Society and editor-in-chief of the National Geographic Magazine, is a San Francisco visitor. Mr. Grosvenor has been a prolific writer on scientific subjects.

C. I. Kephart, electrical and valuation engineer with the Public Service Commission of Oregon for the past few years, stopped over for several days in San Francisco on his way to Washington, D. C., where he will take up his new position as examiner with the Interstate Commerce Commission.

C. M. Masson, illuminating engineer with the Southern California Edison Company, designed the illumination of the grounds of the Huntington Hotel at Pasadena during the National Electric Light Association convention which brought forth much praise from the delegates, and which was described in a recent issue of the Journal of Electricity. In 1903 Mr. Masson came to California and was associated with his cousin, R. S. Masson, then consulting engineer for all the Huntington interests in Southern California. Mr. Masson has been associated with the Southern California Edison Company since 1912.

Ralph A. Gould, chemical engineer, 216 Pine Street, San Francisco, and **Bryant S. Drake**, chemical engineer, 14 Montgomery Street, announce their association, from August 1st, 1920, as a partnership under the firm name of Gould & Drake, Chemical Engineers, with offices at 216 Pine Sreet, San Francisco. Mr. Drake was formerly chemical engineer of the Union Iron Works, San Francisco.

Michio Izawa, assistant traffic manager for the Japanese government railroads of Tokio, and **Kukujiro Hirayama**, railway engineer of the imperial lines of the same city, are in the United States studying modern railway methods. They are paying especial attention to the electrified lines that are proving so successful in the United States, as Japan's fuel supply can only last about fifty years more and the mountainous districts have great possibilities for hydroelectric development.

Roy J. Heffner, who has had charge of the technical department of the University of California Extension Division, with Mrs. Heffner sailed some time ago to take up a position as Educational Expert with the U. S. Army, and will have charge of the vocational training of the army barracks at the Hawaiian Islands. Major Heffner, who is a member of the firm of the Technical Service Co., served during the war in the Signal Corps where he had extensive experience in wireless work. Part of this experience was embodied in a comprehensive survey in the April 1st issue of the Journal of Electricity. His recent achievements in enlarging and coordinating the activities of the University Extension Division have been of the highest order.

OBITUARY

James Mitchell, one of the pioneer electrical engineers who perfected the electric street railway system of Denver, died recently at his summer home, St. James, Long Island. Mr. Mitchell was president and one of the organizers of the Alabama Power Company and installed the first trolley car system in South America.

Meeting Notices for Electrical Men

(An account and pictures of the San Francisco Electrical Development League's trip over the Hetch-Hetchy project appears on the following pages along with an account of the recent conference at which a combination code for the state of California was considered. Notices of the electrical day recently held at the Los Angeles Ad Club and of the meeting at which a Vancouver Cooperative Campaign was launched are also given here.—The Editor.)

S. F. Electrical Development League Visits Hetch Hetchy

During the summer months the San Francisco Electrical Development League suspended its regular weekly meetings, but that fact did not stop a party of members of the League from accepting the invitation of M. M. O'Shaughnessy, city engineer of San Francisco, to take a trip over the Hetch Hetchy development. The party numbered fifty-four, including the guests, and the trip was managed by A. V. Thompson, railway sales agent, General Electric Company, the official guides being A. J. Cleary, chief assistant city engineer, and N. A. Eckart, construction engineer, in charge of the Hetch Hetchy project.

To assure a fair and impartial distribution of berths, they were drawn for by lot after the train had started, but the committee might as well have saved themselves the trouble as almost immediately the group was divided into the noisy and the quiet car. About the time that the noisy group decided it was time to turn in, the train pulled into Hetch Hetchy Junction where the members of the "Alarm Clock Committee" made themselves unpopular by summoning every one to breakfast.

The first day was spent in visiting the various tunnel portals along the route of the Hetch Hetchy Railroad, winding up at the camp at Damsite. The outstanding features of the first day's journey were, first of all, the appetites that most of the men from the city had forgotten they possessed. Second, the drop down the shaft at Big Creek Camp. Third, the view of the Hetch Hetchy Valley from the top of the tramway at Damsite. Fourth, the number of steps in the walkway from the top of the bluff down to the damsite, and the fact that there were twice as many when they climbed back up. And fifth, the great quantity and excellence of the food served at the camps. "Put out that light."

Leaving Damsite early the next morning the party returned over the railroad on the special observation car provided for the trip, until Early Intake siding was reached. After a breath-taking trip down the tramway the party spent the rest of the morning inspecting the power house, penstock, ditch, and the tunnel at Early Intake where the water will begin its eighteen-mile underground trip. The afternoon was spent inspecting the great work that is being done at Groveland, including the up-to-date hospital, the headquarters building, the railroad shops and the employes' club house. After a sumptuous banquet at the Groveland Hotel at which Mr. Cleary told the history of the development, the party proceeded to the special train to be carried back to the Pullmans which were waiting at Hetch Hetchy Junction. It was a tired bunch that crawled on board the Pullmans, but happy and enthusiastic over the possibilities of the development and full of gratitude to "Chief" O'Shaughnessy for a wonderful outing.

BUILDERS OF THE WEST — LXXXIII

JOHN STEPHEN McGROARTY

From the Spanish architecture of its homes to the outdoor breadth of the spirit which builds its empires, a consecutive thread of color runs through the development of the West which traces its way back to the color and romance of its early history. To John Steven McGroarty, author of the Mission Play, who has interpreted for all time the spirit and glory of the Spanish Pacific, this issue of the Journal of Electricity is affectionately dedicated.

Oregon Association of Electrical Contractor-Dealers

The regular meeting of the Oregon Association of Electrical Contractors and Dealers was held at the Chamber of Commerce Monday evening, July 12th.

Mr. McMicken addressed the meeting on the Cooperative Campaign, and strongly recommended that the association send a delegate to the meeting of the advisory committee of the Northwest Electric Light and Power Association to be held in Seattle July 15 and 16.

The American Institute of Electrical Engineers extended an invitation to all members of the Contractor-Dealers' Association to attend the sessions of the Pacific Coast Convention of the Institute being held in Portland.

Mr. McCoy of the Smith-McCoy Electric Co., gave a very interesting report of his recent trip through the East and in conclusion stated that the electric stores in Portland were far ahead of some of the stores in the East.

A general discussion of local conditions was followed by adjournment.

At the regular meeting of the Oregon Association of Contractors and Dealers held on Monday evening, July 26, Mr. Tomlinson, the delegate of the association to the meeting of the advisory committee of the Northwest Electric Light and Power Association, held in Seattle July 15 to 16, gave a brief report of the meeting and stated that a more complete report would be submitted later.

Mr. Boring, of the Pacific States Electric Company, called attention of the meeting to the evident lack of co-operation between the Portland and out-of-town members of the association.

Mr. McMicken of the Portland Railway Light & Power Company outlined a plan of cooperation between the architects, builders and contractors and dealers on the convenience outlet idea.

Considerable discussion was held on the matter of trade classification and Mr. Boring remarked that in his opinion there was a big field for the contractor-dealer in office buildings, theaters and hotels which was not being properly taken care of. It was decided that the second meeting in August be devoted to the subject of jobbers trade classification.

THE SAN FRANCISCO ELECTRICAL DEVELOPMENT LEAGUE'S TRIP TO HETCH HETCHY

After breakfast the party proceeded to Priest portal where they climbed into ore cars and——

Went into the west end of the eighteen-mile tunnel, inspected it and——

Proceeded to Big Creek, where they dropped some 400 feet down to inspect another face. And——

After lunch rode along enjoying the scenery until they reached——

Damsite where they went down to inspect the work on the dam and——

The diversion dam and tunnel. Then after a good night's sleep proceeded to visit the power house at——

Moccasin Creek. Before going on the tramway the bunch felt fine, but——

"Sing Voyer" didn't care for the drop and lost all interest until they inspected the——

Power house where he recognized a few name plates. And one and all gave their heartiest thanks to——

A. J. Cleary, assistant chief engineer, city of San Francisco, the chief guide on the trip.

Electrical Day at Los Angeles Ad Club

Under the guidance of K. E. Van Kuran, local manager for the Westinghouse Company, a splendid program was given before the Los Angeles Ad Club on July 27th.

H. B. Titcomb, vice-president of the Pacific Electric Railway, was the principal speaker, taking for his subject "How Traffic Congestion Can Be Permanently Relieved with the Least Cost to the Public." Mr. Titcomb explained the proposed plan for a joint passenger station and the rearrangement of tracks so that grade crossings might be eliminated. This was supplemented with a discussion of the possibilities of reducing running time to interurban cities by means of tunnels and elevated tracks.

Following Mr. Titcomb, four-minute talks were given on "Hydroelectric Development" by A. H. Leklider, electrical engineer on the Southern California Edison staff; "The Relation of Hydroelectric Development to Growth of Our Community," by Carl M. Heintz of the Westinghouse Company, and "A Lesson From Electrical Development," by A. Carman Smith, a local advertising man.

The meeting closed with the showing of the moving picture "That Fairy in the Snowflake," which was presented at the Pasadena convention.

Pan-Pacific Scientific Congress

The Pan-Pacific Scientific Congress is in session from August 2nd to August 20th in Honolulu. The Chicago Chapter of the American Association of Engineers will be represented by Miss Florence King, a consulting engineer of Chicago. She bears the distinction of being the only woman member of the A. A. E. having a certified engineer's grade.

San Francisco Chapter, A. A. of E.

The August meeting of the San Francisco Chapter of the American Association of Engineers was addressed by Walter B. Cole, manager of the Marchant Calculating Machine Company and president of the Oakland Chamber of Commerce. Mr. Cole's address was on "The Relation of the Chapter to Civic Organizations" and proved to be of great interest to the members of the chapter.

Combination Code for State of California

At a recent conference between the committees representing the California State Association of Electrical Contractors and Dealers, the Electrical Supply Jobbers' Association of the Pacific Coast, the N. E. L. A. Pacific Division, and the Manufacturers' Safety Association of California, a full discussion of the proposed new code now being formulated by the Industrial Accident Commission took place. This discussion brought out the viewpoint of all present and at its conclusion it was unanimously agreed, that the interest of the public and the necessities of the electrical industry would best be served by action along the lines set forth in the following resolution:

"**Resolved:** We hereby recommend the uniting of the National Electrical Code (commonly known as the Fire Code) with the Electrical Utilization Safety Orders (commonly known as the Safety Code) into a Combination Code to be administered and enforced by the Industrial Accident Commission of the State of California, in so far as its jurisdiction may apply, provided:—

"**First,** That the National Electrical Code, not merely parts or revisions thereof, be incorporated in the proposed code, with the Commission having power to make mandatory any of the recommendations in said National Electrical Code; and that the proposed code shall be revised in keeping with the periodical revision of the National Electrical Code.

"**Second,** That the proposed code directly recognizes the labels issued by the Underwriters' Laboratories, both fire and accident, thereby eliminating the necessity of duplicate laboratory tests and approval in this state, all in accordance with par. 5 of the resolution adopted by the General Committee on Code Revision, bearing date of Sept. 22, 1919.

"**Third,** That in combining the two codes, the Commission adopt a new form which permits the grouping of all rules relating to a specific subject under the title of that subject; also that the subject titles relate to the classification of the installations; but this arrangement shall be so carried out as to definitely preserve the language and identity of the Fire Code rules as distinguished from the Safety Orders.

"**Resolved Further:** That the respective representatives of the four organizations, now serving on the Advisory Committee, cooperating with the Industrial Accident Commission in the formulation of the new code, be instructed to govern themselves in accordance with the recommendations set forth in the foregoing resolution."

Vancouver to Have Cooperative Campaign

Vancouver, B. C., is planning an Electrical Cooperative Association which had its conception at a dinner given last month by George Kidd, general manager of the British Columbia Electric Railway to representatives of the electrical industry in Vancouver. Committees were formed, a temporary organization set up, and arrangements made for a meeting in the near future to which all members of the electrical

industry in Vancouver will be invited to form a permanent organization.

Those present at the meeting were: W. G. Murrin, assistant general manager, B. C. Electric Railway Company; E. E. Walker, sales manager, B. C. Electric Railway Company; R. F. Hayward, general manager, Western Power Company of Canada, and James Lightbody, publicity manager, B. C. Electric Railway Company, representing the central stations. The manufacturers were represented by J. R. Read, local manager of the Canadian Westinghouse Company, and H. Pim, local manager of the Canadian General Electric Company; J. F. Little, local manager of the Northern Electric Company, and W. C. Mainwaring, local sales manager of the Northern Electric Company. The jobbers were represented by F. P. Cope and E. B. Horsman, and the contractor-dealers were represented by E. Brettrell, S. E. Jarvis, and W. W. Fraser.

N. E. L. A. Executive Committee

In outlining the work of the N. E. L. A. for the coming year at the first meeting of the National Executive Committee at Association headquarters, President Insull made several important committee changes. The work of the following national standing committees was placed under the direction of the Public Relations Section: Accident Prevention, Company Employes' Organizations, Membership, Cooperation within the Industry, Public Information, Service, and Relations with Educational Institutions.

In continuing the work of the Committee on Electrical Resources of the Nation, the scope of activities of the committee was changed from a post-war basis to a peace basis, the committee being directed to estimate and summarize the total demand for electrical energy during the years of 1920-22 inclusive, and the means at hand for supplying same; and also to estimate the increase in capital expenditures necessary to provide the necessary capacity to take care of the demand, and to analyze the relative effectiveness of private and public ownership.

The public policy of the electrical industry being of paramount importance in association work this year, S. Z. Mitchell, president of the Electric Bond and Share Company, was tendered and accepted the chairmanship of the Public Policy Committee.

The Wiring Committee, formerly under the Commercial Section, was made a national standing committee, with R. S. Hale, of the Edison Electric Illuminating Company of Boston, chairman. The Technical and Commercial Sections will each elect a vice-chairman of the committee, these three appointing the other members of the committee.

Other committees and the chairmen appointed are: Rate Research, Alex Dow, The Detroit Edison Company; Constitution and By-Laws, W. C. L. Eglin, The Philadelphia Electric Company; Membership, Walter Neumiller, The New York Edison Company; Electrical Resources of the Nation, M. S. Sloan, Brooklyn Edison Company, Inc.; Doherty and Billings Prizes, A. S. Loizeau, Consolidated Gas, Electric Light and Power Company, Baltimore; Electrification of Steam Railroads, F. M. Kerr, Montana Power Company, Butte; Finance, Joseph B. McCall, The Philadelphia Electric Company; Lamp, Frank W. Smith, The United Electric Light and Power Company, New York; Water Power Development, Franklin T. Griffith, Portland Railway, Light and Power Company.

San Francisco Chapter, A. A. of E.

C. D. Marx, head of the civil engineering department of Stanford University, addressed the American Association of Engineers recently on "The Proposed Department of Public Works." The speaker has advocated the transfer of the jurisdiction over river and harbor improvements from the military engineers to civilian engineers for the past thirty-six years and is now leading the California engineers in the fight to secure passage of the Jones Reavis bill in Congress.

The speaker discussed the new bill in detail and told how the engineering works of our governments were spread over five departments and many bureaus causing needless duplication of effort and wasteful expenditure of public funds. The new bill proposes the change in name of the Interior Department to the Department of Public Works and the removal from the department of all matters pertaining to education and care of public wards, which are now sandwiched in with purely engineering works.

The Chamber of Commerce of the United States secured a majority vote among its members but due to a shortage in the total vote cast, it cannot officially endorse the bill.

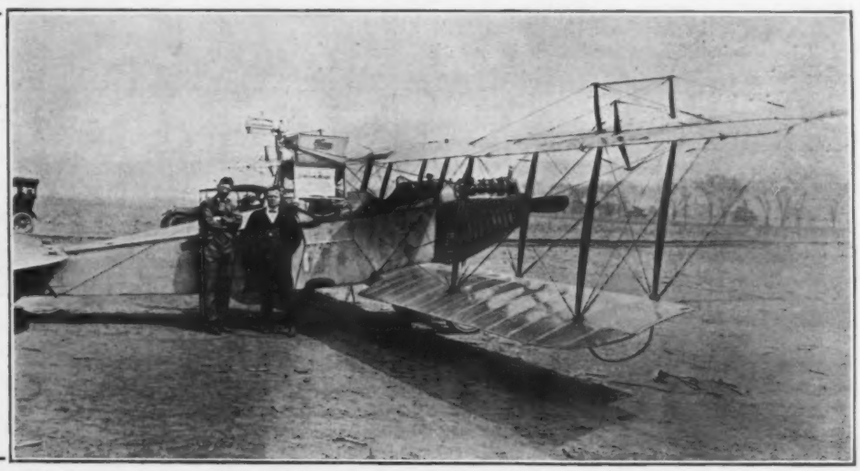
It will be recalled that the Taft plan for reorganization of all departments failed of passage due to the magnitude of the problem. Franklin K. Lane recommends the bill and Herbert Hoover will lend his influence in its passage. It is certain that over 100,000 engineers will work actively in support of the measure in the interest of governmental efficiency. Friends of the measure may secure copies of the bill and literature from the Department of Public Works Association, New York, or from Professor Marx.

Water Power Commission Meets

Applications coming in large part from the West to the office of the federal water power commission for permits and licenses to develop water power now aggregate 2,000,000 horsepower, according to O. C. Merrill, executive secretary of the commission. The commission, created under the water power bill recently passed by Congress and composed of the Secretaries of War, Interior and Agriculture, held its first meeting recently, without waiting longer for the return of Secretary John B. Payne. The anxious desire of applicants for some definite action hastened the meeting. Secretary Baker and Secretary Meredith were present.

DELIVERING BY AIRPLANE

This picture is of the airship which the Linker Electric Company of LaCrosse, Wis., used in delivery a favored Thor Washing Machine during a recent campaign. The delivery was made to Onalaska, about eight and a half miles away, in twelve minutes after the take-off. Needless to say this stunt stimulated the campaign sales to a great extent and secured a great many future prospects for the company.



HAPPENINGS IN THE INDUSTRY

PLANS FOR TUNNEL CONSTRUCTION

In a letter to the city council of Seattle J. D. Ross asserted that the construction of a tunnel at Cedar Lake to increase the output of the city's Cedar Falls hydro-electric power plant would permit the City Light Department to reduce its light and power rates to their original figure—about 20 per cent—within a year, pay off all outstanding warrants, and avert the possibility of a "shutdown of many Seattle factories and the darkening of streets and thousands of homes."

Mr. Ross urged immediate action on the tunnel project, and also asked the council to proceed with the development of the Skagit River power project with all possible speed, declaring that the city plants are now operating at a cost of four or five times the cost of Skagit power.

He opposed the substitution of coal for fuel oil at the Lake Union auxiliary power plant, declaring that the installation of coal burners and the purchase of the first year's supply of coal would cost the city $1,440,000, while the Cedar River tunnel project would cost but $1,100,000, and would then become a permanent asset. The $1,000,000 worth of coal, on the other hand, he said, would be a dead loss and would soon have to be repeated.

Mr. Ross' plan is to construct a tunnel 8,500 feet long through solid rock from the masonry dam on Cedar River, tapping Cedar Lake for hydroelectric power, which he believes will increase the output of the Cedar Falls power plant from its present maximum of 15,000 horsepower during the winter months to 50,000 horsepower.

Mayor Hugh M. Caldwell has asked the Council to appoint a commission to investigate the project, and City Engineer A. H. Dimock has requested the appropriation of $5,000 for a similar purpose. The project has also been indorsed by the Greater Seattle Bureau of the Chamber of Commerce, which has also recommended the appointment of a commission.

DISPLAY AT THE CALIFORNIA STATE FAIR

A bulletin from the California Tractor and Implement Association announced that all the power farming machinery interests are to concentrate their exhibits in one huge display this year at the California State Fair which is to be held at Sacramento, from the fourth to the eleventh of September. This display will be under the auspices of the California Tractor and Implement Association.

INCREASE IN OIL OUTPUT

The production of crude oil during the month of May averaged 278,343 bbls. per day, or an increase of 3,446 bbls. as compared with April's output. However, as the May shipments were 295,100 bbls. per day, an increase of 4,677 bbls. daily as compared with April, the stocks were decreased 520,087 bbls. during the month. Fifty-seven new wells were completed during May, with an initial daily production of 8,795 bbls. The total shipments from the field for the month of May were over 9,000,000 bbls.

NEW INSTALLATION IN PORTLAND

Construction work is about fifty per cent completed on the installation of a 500 hp. Stirling, three-phase boiler at the Station "L" steam plant of the Portland (Ore.) Railway Light & Power Company. This boiler will burn "hog fuel," or saw mill refuse normally, but is being equipped to burn oil also, and will serve as an auxiliary and provide additional boiler capacity for future developments.

INCREASED SAILINGS BETWEEN PACIFIC COAST AND THE ORIENT

Considerable increase in passenger traffic and commerce between Pacific Coast ports and the Orient, by the end of this year, and perhaps earlier is forecast in the recent allocation to steamship companies on this Coast of fifteen new passenger liners.

All fifteen vessels are now under construction in the East, and the work of finishing them is being pushed with all reasonable speed.

They will each have a speed of 17 knots, and a deadweight tonnage of 12,000.

The Pacific Mail Steamship Company, which has been allotted five of the vessels, said its share will enable the company to handle four times its present passenger traffic to the Far East every month. Further these five new vessels will make possible sailings from San Francisco every two weeks instead of the present monthly sailings.

According to a statement issued yesterday by officials of the same company at Seattle, the company will establish a new and direct line from this coast to Vladivostok and Shanghai without touching at Japanese ports—a route, it is said, for which there is an insistent demand, due to the rapidly increasing volume of intercourse between the United States and China.

Five of these fifteen ships have been allocated to the Pacific Mail Company, five to the Pacific Mail Company, and five to the Matson Navigation Company.

LICENSING OF OREGON ENGINEERS

Since the Oregon State Licensing Law for Engineers has been in effect 1,160 licenses have been issued under the following classifications:

805 civil engineers; 178 mechanical engineers; 157 hydraulic engineers; 119 electrical engineers; 64 mining engineers; 50 structural engineers; 36 metallurgical engineers; 14 chemical engineers; 12 logging engineers; 11 naval engineers; 2 fire protection engineers.

Since July 1, 1920, licenses are being issued after examination only, prior to that time they were issued upon application.

SOUTHERN SIERRAS EMPLOYEES' MEETING

Over one hundred employees of the Southern Sierras Power Company attended a meeting held in Riverside on July 23 to discuss the development plans of that company.

Chief Engineer C. O. Poole delivered an interesting lecture, illustrated with lantern slides, in which he explained the purpose of the company's generating plants, transmission lines and distribution system. The pictures included scenes at Rhinedollar Lake, lumbering operations, tunneling and dam construction.

Music was furnished by the Southern Sierras orchestra, the meeting being in charge of assistant treasurer, A. S. Cooper.

RUSSIAN AND AMERICAN ENGINEERING SOCIETIES

In an address delivered before a recent joint meeting of the founder societies held for the purpose of discussing the value of a liaison between the engineering societies of Russia and America, N. A. Stephanoff, president of the Russian Society in America, brought out some interesting facts concerning Russia's engineering development. He said in part:

"Every specialty of engineers used to have its own societies, grouping all its members, as the government of the old regime was strongly opposed to any scheme of one large union, which would have united all the engineers of Russia. However, within two months of that government's overthrow, one All-Russian Engineers' Union was formed, which admitted in its ranks, not only the graduate engineers but also the practical, regardless of political opinion. This association numbers about 60,000 members.

"The Russian engineers have always been deprived of their initiative by the government * * * and it is only during the fifteen years which preceded the war that they really began to come into their own and occupy the first place in their own country. * * * As to the psychological characteristics of the Russian engineer, first comes the absence of selfish aims in his work. I can best illustrate this by mentioning that during my 22 years of experience in Russia, I never heard of one industrial engineer having made money."

In speaking of Russian achievements in engineering W. F. Dickson, director of the Russian Singer Society, said:

"In the matter of bridge building some very fine work has been accomplished. The suspension bridge across the Dnieper at Kiev, the bridges over the Volga at Syzran and Yaroslavl, the Palace Bridge over the Neva at Petrograd, all rank among similar structures in this and other countries.

"The great Siberian Railway stretching from the Gulf of Finland to the Pacific Ocean and linking together Petrograd and Vladivostok, cities five thousand miles apart, can be compared favorably with transcontinental lines in America. The skill displayed by the Russian engineers in spanning the wide Siberian rivers and in piercing forty-two tunnels through the rocky cliffs bordering the southern shores of Lake Baikal, situated about half way across Siberia, is something engineers of any nationality might be proud of."

PACIFIC GAS & ELECTRIC COMPANY TO SELL MORE STOCK

The Pacific Gas & Electric Company has been authorized by the Railroad Commission to issue and sell one million dollars of its first preferred capital stock at not less than $80 a share. In the application to the Railroad Commission for permission to sell this stock, A. F. Hockenbeamer, vice-president and treasurer of the company, stated that they would need approximately twenty million dollars during the remainder of 1920 and 1921 to proceed with the contemplated construction work. The proceeds of the sale of this new block of stock is held subject to the orders of the Commission.

POSITIONS FOR ENGINEERS

The United States Civil Service Commission announces open competitive examinations for the positions of engineer at $2,400, or over per year, of assistant engineer at $1,800 to $2,340 per year and of junior engineer at $1,440 to $1,740 per year. Vacancies in the Water Resources Branch of the Geological Survey at these salaries will be filled by these examinations.

On account of the needs of the service, papers will be rated promptly and certification made as the needs of the service require. In the absence of further notice, applications for these examinations will be received by the Commission at Washington, D. C., until the hour of closing business on December 1, 1920. If sufficient eligibles are obtained, the receipt of applications may be closed before that date, of which due notice will be given.

Appointees will generally be assigned to the work of gauging streams and the study and investigations of water supply, water utilization, and power in the United States. The work will consist of field investigations and the writing and review of the resulting reports. The field of investigation may be in any part of the United States.

The rating of applicants for positions as assistant engineer will be half on general and technical education and training and half on professional experience. Those applying for positions as junior engineer will be considered according to the following rating:

	Weights
1. Surveying	10
2. Mathematics	20
3. General hydraulics	30
4. Water-power engineering	10
5. River hydraulics (under the subject of river hydraulics, including stream gauging, in the statement of ratings the applicant must indicate the course or courses in which this subject was studied)	15
6. Training and experience	15
Total	100

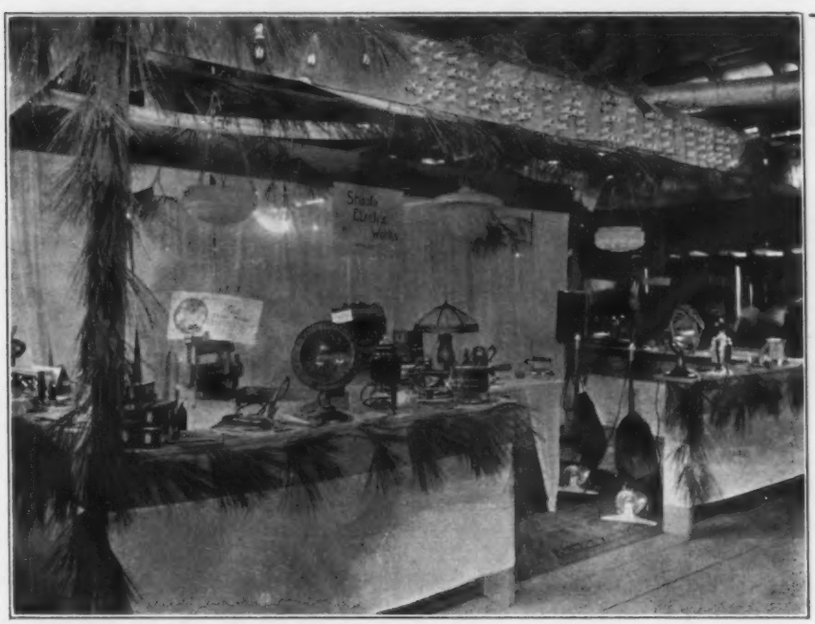
SIXTY MILLION DOLLAR SUIT OVER WATER RIGHTS

The town of Antioch and the farmers of the delta regions of the Sacramento river are endeavoring to secure an injunction against the rice growers of the upper regions of the river to prohibit them from taking excessive amounts of water from the river for irrigation purposes. The plaintiffs declare that the excessive use of water in the irrigation of rice fields has brought the level of the river down to such an extent that the salt water of Suisun Bay is backing up in the river, rendering the waters unfit for domestic or agricultural uses. The defendants in the action have declared that if they are prohibited from further irrigation of their fields it will mean a loss to them of $60,000,000 as their entire crop of rice would be spoiled.

EXTENSION COURSE IN ELECTRICITY

A series of courses in electricity given under the Extension Department of the University of California are to be opened on the evening of August the seventeenth, at the Oakland Polytechnic High School which is located on Frederick near First Street, Oakland. These courses will be given under the direction of A. L. Jordan.

A beginning and an advanced course will be given so that students may be placed at any time in a class suited to their needs. Classes begin at 7:15 p.m.



This extremely attractive booth belonging to the Shasta Electric Works was a feature at the Farm Bureau Fair which took place a short time ago at Anderson, California. As can be seen, all of the electrical appliances which go to make up a modern electrical home are displayed here to advantage.

APPLICATION TO MORTGAGE BUILDINGS

To secure the funds estimated to be necessary to complete its hydroelectric development known as the Caribou plant on the North Fork of the Feather River and to construct a steel tower transmission line from the plant to Valona in Contra Costa County, the Great Western Power Company of California has applied to the Railroad Commission for authority to mortgage its entire holdings to secure a bond issue of $5,000,000. The Commission is asked to approve the company's plan to issue and sell $3,500,000 of the bonds to E. H. Rollins and Sons at 93 and accrued interest.

In April, 1919, the Commission authorized the Great Western to issue and sell $6,000,000 of bonds and $1,500,000 of preferred stock. Last May the company was authorized by the Commission to issue and sell an additional $1,500,000 of its preferred stock.

CO-OPERATION BETWEEN THE AGRICULTURIST AND THE ELECTRICAL INDUSTRY

A Letter to the Editor

Sir:

As I am conversant with the demands for agricultural power in both the central and southern sections of the state, and was interested in the development of the small motor-driven unit and storage basin—the answer to financial problems of the rancher and the operating difficulties of the power corporation—I should like to make a plea for cooperation between agriculturist and utility and the adoption of a permanent instead of a transitory solution of the present power situation.

I refer especially to night irrigation, the alternate operation of pumping plants running fifteen days or less per month, and the limiting of plant operation to non-peak hours—8 p.m. to 6 a.m., as proposed in the March first issue of the Journal of Electricity.

Undoubtedly the precipitation on the West Coast since 1917 has been below normal, and conditions now obtaining are acute, the ever-increasing demand for electrical power being now in excess of the quantity of energy generated in periods of drought. But it is also a self-evident truth that in the years prior to 1915, comparatively little attention was given to the character of the load connected to the distribution system of the utilities. Flowing wells were pumped in an effort to secure a greater irrigating head. Twelve and sixteen-inch holes were drilled to unnecessary depths, and equipped with pumps far in excess of the capacity of the wells. Large heads of water were desired for only one hundred or two hundred hours out of each seven hundred and twenty-four hours. Neither the rancher nor the average public service corporation gave consideration to the water rate, to the actual use of the water, or to the most efficient method of pumping water, (a) with a minimum lowering of the water level in the well or, (b) at a fair and equitable cost. The result was not only pernicious to the rancher, but placed upon the power corporations an unnecessary demand for electric power.

The remedy, however, is not in the promulgation of emergency measures such as night irrigation, but in the utilization by the rancher of such pumping units as will deliver over a given period of seven hundred and twenty hours the same quantity of water or more than is now pumped in periods ranging from one to two hundred hours. Such a scheme, permanent in its character, will not only be in harmony with aggressive and comprehensive plans which may be discussed by the Department of Agriculture and for the conservation of water, but will permit of the systematic operation of generating units feeding an interconnected system at a minimum fuel consumption—coal, oil, or white coal.

The irrigation load is the result of the large inefficient motor-driven pumping plants, developed without reference to any normal percentage of growth. Acreage planted to alfalfa and yielding eight to twelve tons to the acre and groves supplying citrus fruits, were the mecca for many "home-seekers" as well as those who sought the ownership of a California country home. Each section purchased demanded a pumping plant, and too often the plant of a neighbor was duplicated without inquiry as to its efficiency or water strata tapped. Lessee succeeded owner, and only after useless and expensive changes in pumps did experience become a teacher The large unit was discarded, and the small direct-connected pump, installed in a pit, or the deep well Pomona head delivering water to an oil-lined reservoir or storage basin, proved the answer to perplexing problems of ranch management and financing. Utility management cooperated with the rancher to solve his problem. Will the same management direct its efforts toward the elimination of many more large and inefficient pumping plants—an enduring solution to the problem now uppermost in agricultural circles—or will expensive temporary emergency methods be pursued? Every dollar expended now in remodeling agricultural pumping plants not only improves load and power factor, but is a decisive step in the interests of conservation of fuel and the effective utilization of water, and is a potent factor in the reconstructive program necessary for the welfare of the individual, the growth of the community and for the increase in productiveness of the commonwealth.

R. B. MATEER,
Philadelphia Electric Co., Pa.

TRADE NOTES

Recent Appointments —

The Booth Electric Furnace Company, Chicago, report a number of additions to their sales and engineering staff. Mr. B. G. Tarkington, formerly industrial heating engineer with Hodenpyl-Hardy Company, Jackson, Mich., is located at their Chicago office in charge of district sales.

The Buckeye Products Company, Cincinnati, Ohio, who have charge of sales in the Cincinnati territory, have placed Mr. D. E. Carpenter, formerly of the Detroit office of the Westinghouse Electric & Manufacturing Company, in charge of sales of Booth furnaces in that district. Among the foreign offices recently opened is one for Australasia in charge of Mr. Bartholomew Bannon, at Sydney.

New Iowa Representative —

J. K. Alline, formerly of the Electric Appliance Company of Chicago, Illinois, is now Iowa representative for the Packard Electric Company of Warren, Ohio, manufacturers of transformers and automotive cable.

Change in Plant Products —

After completing their war contracts, the Toledo Screw Products Co. converted their plant to manufacture the Air-Way Electric Cleaner. Production now exceeds 250 cleaners a day and the facilities are being increased to permit a daily production of 1000.

New Establishment in Colorado —

An enterprise known as the Western Slope Electric Company has been established in Telluride, Colorado. This company announces its intention of placing machinery, rewinding motors, doing house wiring, and other types of electric work. H. H. Ford, formerly of Colorado Springs, is secretary and manager of the new enterprise.

New President Elected —

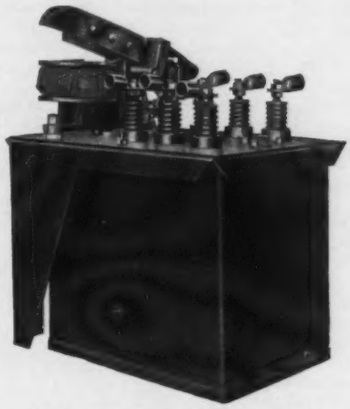
At a special meeting of the Board of Directors of SKF Industries, Inc., New York City, the resignation of B. G. Prytz, as president, has been accepted, Mr. Prytz having been elected managing director of the parent company, with headquarters at Gothenburg, Sweden. At the same meeting F. B. Kirkbride, vice-president since the organization of the company, was elected president to succeed Mr. Prytz.

LATEST IN EVERYTHING ELECTRICAL

(The new oil immersed magnetic contactor which is described and illustrated on this page is of interest because the reliability of operation is greatly increased through the use of a clapper type magnet and armature. An unusually helpful handbook for electricians and one on Controllers for electric motors are reviewed in the column on Books and Bulletins.—The Editor.)

OIL IMMERSED MAGNETIC CONTACTOR

The frame of this contactor, which is of heavy sheet iron, is arranged for wall or switchboard mounting, and carries two cast iron supports with two insulated shafts carrying the contacts. Copper leaf brush contacts are saved from all wear due to breaking the circuit because auxiliary arcing contacts are provided for this purpose. Leads from the contacts connect with suitable terminals extending through high tension insulators mounted on the top of the frame. The armature is firmly pivoted to the frame, and is connected by a rod to an arm of the shaft carrying the moving contacts.



New C-H oil immersed magnetic contactor operated by a clapper type magnet and armature which increases reliability of operation over the solenoid and plunger type.

Oil tank removed showing contacts and arcing shields. By breaking in a horizontal plane, the arcs do not damage other parts.

The attraction of the armature against the face of the magnet rotates the shaft and closes the switch, which is normally held open by the weight of the moving parts.

A good head of oil is maintained over the contacts by providing a sheet metal tank of ample capacity, and as the contacts are situated above the operating shaft, they are away from any sediment which might accumulate in the bottom of the tank. The arc is broken at the contacts in a horizontal direction and therefore rises to the point of rupture without burning other parts. Transit shields prevent arcing across adjacent poles.

This new oil-immersed switch may be arranged to have two contactors act as a reversing switch, in which case they are mounted side by side, so when one switch is closed the nose on the armature interferes with the movement of the armature of the other contactor, thereby preventing the closing of the other switch, which would short-circuit the line.

Book and Bulletins

Electrician's Handy Book

By T. O.Conor Sloane; 825 pp., 4½ x 6½; 600 engravings. Published by The Norman W. Henley Publishing Company, New York City.

A revised and enlarged edition of this book has just been issued. It covers in the most practical manner, the entire field of electricity. It begins with the A, B, C's of the subject and takes up in turn motors, dynamos, switchboards, electric railways, various types of arc lamps, electric furnaces, and many other advanced branches of the science.

The author of this book deserves credit for having covered this extensive subject in a complete yet most practical and readable manner.

Controllers for Electric Motors

By Henry Duvall James, B.S., M.E. 351 pp., 5½ x 8; 259 illustrations. Published by D. Van Nostrand Company, 25 Park Place, New York City.

The object of this book is to bring the Industrial Controller Art to the attention of technical students, operating engineers, purchasers and users of electrical apparatus so as to give them a general idea of Industrial Controllers and their principles of operation.

A great number of illustrations are used, the majority of which have been selected for the purpose of showing principles of operations. Most of the diagrams used are considerably simplified for the purpose of clearness. The processes and methods of operation are described in some detail in the section on applications.

The Motor Book

The Dalley Electric Company of St. Louis, Missouri, have published an attractive booklet which gives an account of the motor production which is taking place at the company's plant. Descriptions and illustrations of the various types of motors are followed by a page of shop facts and an installation guide.

Charts of Heat Losses

A series of graphic charts has been published recently by the Celite Products Company. These are an adaptation of the coordinate calculating chart, based on D'Ocane's method of isopleth, to the computation of heat losses and temperature gradients. They make it possible to obtain accurate results easily and quickly and eliminate the tedious and involved calculations formerly required. A pamphlet which includes a reproduction of some of these charts and directions for use of those which determine heat flow through furnace walls, is being distributed by the company.

NEW ELECTRICAL DEVELOPMENT

(First steps in the construction of a diversion dam and an important court decision which has to do with the Skagit River project, are among items from the Northwest. The Pacific Central district reports the rebuilding of a high voltage line in one part of California and the erection of a large outdoor substation in another, while the Southwest reports the construction of the largest service station in the world, as well as plans for establishing a 22,000-hp. power plant in New Mexico. An enlarged irrigation district demanding a supply of electric power and the extension of a cities lighting system are among Intermountain items.—The Editor.)

THE PACIFIC NORTHWEST

ABERDEEN, WASH.—Oakville residents voted Tuesday, August 10, on issuance of bonds for $20,000 for the purchase of the Oakville Electric Light & Power Company plant at that place. The election was held in the council rooms of the town hall.

PORTLAND, ORE.—The Pacific Telephone & Telegraph Company has filed with the city building inspector plans for the new exchange it proposes to construct at 771 Stanton Street, in Irvington. Preliminary estimates place the cost of construction at $123,691.

SPOKANE, WASH.—Favorable conditions for a new moving picture theater to cost at least $750,000 were found in Spokane by Frederick Frisk, manager of the United States Exchange of San Francisco. Mr. Frisk will return in a few months to further plans for the theater building.

PORTLAND, ORE.—Lightning arresters are to be installed on the 11,000-volt circuit supplying power to Municipal Terminal No. 4, according to a decision of the Public Dock Commission. This action was decided upon following the recent electric storm which did considerable damage to wiring and equipment at the terminal.

LLWACO, WASH.—Llwaco faces the necessity of being without light, power or water for an indefinite period as the result of a fire which completely destroyed the plant of the North Shore Light & Power Company. The loss of E. F. Wood, the owner of the light and power company, has not been estimated, and no plans have been made for rebuilding the plant.

DALLAS, ORE.—The Mountain States Power Company has about completed the installation of a 750-kw. generator to be driven by a Curtis steam turbine. Hog fuel will be burned. This company has also contracted with the Willamette Valley Lumber Company of Dallas to supply them with 1600 hp. of electric energy for their new saw mill which will be electrically operated throughout.

PORTLAND, ORE.—A contract has been awarded for the construction of the extension of the St. Johns line of the Portland Railway Light & Power Company to Municipal Terminal No. 4. The contractor will perform all of the work on the roadbed, furnish the ties, lay the track and repair the paving. The work on the extension will be started at once and rushed to completion.

OLYMPIA, WASH.—A Contract for digging and dredging of the main line ditches for the drainage system in the Black Lake territory, known as Consolidated Drainage District No. 101, was let by the board of county commissioners to E. J. Cheatham and Sons of Spokane, and work on the big project will be started as soon as the contractor can get his equipment on the ground.

SEATTLE, WASH.—That Supt. J. D. Ross' plan to tap Cedar Lake with a tunnel 8,500 ft. long leading to the city light department's hydroelectric plant on Cedar River is entirely feasible was stated in a recent communication to the city council by City Engineer A. H. Dimock, who recommended an appropriation of $5,000 for test borings and surveys. Mr. Dimock's report was received by the council utilities committee and was ordered placed on file.

BRIGHTWOOD, ORE.—The Brightwood Company, through W. C. Borthwick, of Portland, has applied to the State Engineer for a permit to appropriate 10 second feet of the water of Little Sandy River, tributary to Bull Run River, for power, which it is stated will be devoted to general local use. The company will construct a timber crib dam, timber headgate, and a canal or flume 1¼ miles long, at an estimated cost of $5,000.

PORTLAND, ORE.—Plans for the new Southern Pacific electric passenger station, which is to occupy the site of the Lyric Theater at Fourth and Stark Streets, are being prepared by J. H. Christie of San Francisco, architect for the Southern Pacific Company. Reconstruction of the building will require several months.

SPRINGFIELD, ORE.—The Mountain States Power Company, who operate the lighting plant in this place, are installing a 600-hp. Stirling boiler unit, to provide additional steam for electric generation.

GRANT'S PASS, ORE.—First construction has started on the 500-ft. concrete diversion dam at Savage Rapids for the big gravity project of the Grants Pass irrigation district. Work will be prosecuted now under high pressure, with day and night crews working the equipment on hand 24 hours a day in order to accomplish results during the low stage of the river. The excavation for the power house on the north bank is already 50 per cent completed, and by the time the north half of the river bed is cleaned off, will be complete.

SEATTLE, WASH.—A letter from City Superintendent of Lighting Ross to the city council calls particular attention to several salient points as effecting the generating of electric current for the city's use and emphasizes what Superintendent Ross considers as serious drawbacks to using either powdered coal, hogged fuel or fuel oil to generate power. The changing of the equipment of the Lake Union steam plant so that coal could be used instead of oil, as has been outlined to the council, would cost $640,000 and this expense, according to Superintendent Ross, would be a dead loss when the Skagit plant is eventually in operation.

BELLINGHAM, WASH.—In an order entered in the superior court by Judge Hardin the city of Seattle wins a clear-cut decision in the case brought by Whatcom county and Skagit county property owners seeking to prevent Seattle from developing its hydroelectric project on the Upper Skagit River. Judge Hardin directed counsel for the city of Seattle to draw an order covering his verbal opinion, which is to be signed by defense counsel and submitted to the court for approval. The action is preliminary to condemnation proceedings contemplated by Seattle for the building of a railroad and power project. It is probable that the condemnation case will come before the court at the September jury terms.

SEATTLE, WASH.—Every electrical contractor in Seattle will be required to obtain a license from the city, and those who have been in the electrical contracting business for less than two years, including new applicants, will be required to pass an examination, if a proposed revision of the city electrical code is adopted by the city council. The new code has been drafted by a committee appointed by the city building department, consisting of representatives of the Building Owners and Managers' Association, the architects, master builders, electrical contractors and electrical journeymen, and is now in the hands of Corporation Counsel Walter F. Meier for an opinion as to its validity. It provides for appointment of a board of examiners before whom contractors who have been practicing in Seattle less than two years will be required to appear before they are granted a city license. Contractors who have been in the business more than two years need not be examined, according to the provision of the code, but they must apply for permits within three months after its adoption. New applicants are required to pass an examination.

THE PACIFIC CENTRAL DISTRICT

SCOTIA, CAL.—The Pacific Lumber Company's mill "A" at Scotia is to be operated by electricity. A 2000-watt turbine will be installed.

MARYSVILLE, CAL.—The Pacific Gas & Electric Company has paid the city of Marysville $538.08 in settlement for its franchise for the year 1920. This represents 3 per cent of the 40 per cent gross receipts from the fuel gas service maintained by the company during that period. Figures show the Pacific Gas & Electric Company realized $44,840.

ALAMEDA, CAL.—The Municipal Electric Light Company's net profit for the fiscal year of 1919-1920 amounted to $71,000. This year's profit is nearly 50 per cent increase over the fiscal year of 1919, which was $46,844. Because the city owns its plant the consumers were saved $34,032 due to the low rates which they would not have had if it had been a privately-owned company.

SAN FRANCISCO, CAL.—Gross earnings of the Great Western Power system increased $44,186 in May over the same month of last year, and net after taxes, $29,801. The balance after accrued preferred dividend was $2581. For twelve months ending with May, gross increase amounted to $606,766, and net after taxes $149,-509. Balance for the period after accrued preferred dividend decreased $105,294.

SAN FRANCISCO, CAL.—The Fair Oaks Electric Company, which sells electricity for light and power to the territory in the Fair Oaks irrigation district, including the village of Fair Oaks, in Sacramento county, have asked the Railroad Commission for authority to establish higher rates for electricity. The company's rates have not been changed in four years and it is now claimed that they are no longer remunerative.

SAN FRANCISCO, CAL.—To secure the funds estimated to be necessary to complete its hydroelectric development known as the Caribou plant on the North Fork of the Feather River, and to construct a steel tower transmission line from the plant to Valona in Contra Costa county, the Great Western Power Company of California has applied to the Railroad Commission for authority to mortgage its entire holdings to secure a bond issue of $5,000,000.

RICHMOND, CAL.—Consolidation of the lines of the power companies and street car company on a single set of iron poles, from which street lights will also be suspended, is proposed in

plans drawn by the Western States Gas & Power Company, with which the city is entering into a new contract for street lights. The city council has withheld approval of the contract until provision is made for an electrolier system for the business district.

NEVADA CITY, CAL.—The high voltage line of the Pacific Gas & Electric Company between the Colgate and Drum power houses is to be rebuilt during the next few months in order that the carrying capacity may be increased from 30,000 to 60,000 voltage. Materials are being assembled and crews organized for the work. The work is thirty miles in length, and the rebuilding is estimated to cost $225,000. The work will not be completed before January 1.

STOCKTON, CAL.—According to estimates filed with the city council, Fred H. Tibbitts, consulting engineer, Alaska Commercial Building, San Francisco, the present value of the Pacific Gas & Electric Company's water plant is $1,332,736. The city is contemplating the purchase of the system through a bond issue. Should the system be purchased and the recommendation of Engineer Tibbitts be accepted, the city will spend $186,539 in extensions to districts not now served.

TEHACHAPI, CAL.—The town of Tehachapi, which sells and distributes electricity for both lighting and power purposes to consumers beyond its corporate limits, has applied to the Railroad Commission for authority to increase its charges for the service beyond the town limits. It is proposed to make the rate sufficiently high to take care of the surcharge of twenty-seven per cent collected by the Southern California Edison Company on its bills for electric energy sold to the town.

YUBA CITY, CAL.—Arrangements were made by the Sutter-Butte Canal Company to complete its system of canals in Sutter county in order that by the opening of next season the company will be in a position to serve 24,000 acres of land with water for irrigation. The greater portion of this area is rice land. The extensions will cost in the neighborhood of $500,000, to be shared equally between the canal company and the land owners who will be benefited by the extension of the irrigation service.

OAKDALE, CAL.—The State Water Commission has revised its ruling which threatened to hold up the contemplated building of the Melones reservoir. The commission which in a previous letter to the Oakdale irrigation district held that no storage permit could be issued unless the district owned the property—objection having been made by the Calaverras Copper Company—has in a second letter held that the district may by contract or agreement secure the reservoir site, ownership to be secured after the bonds are voted.

BAY POINT, CAL.—The Bay Point Light & Power Company has purchased the land at the foot of Bay View Avenue and the San Francisco-Sacramento Railroad tracks and will start immediately to erect a large outdoor power substation. The power company's present substation is located in the yards of the Coos Bay Lumber Company and will soon be inadequate for the size of transformers that are now needed. A large switching house is to be built, containing switchboards, oil switches, meter and other equipment necessary for the safe operation of the system.

SAN FRANCISCO, CAL.—The United Railroads of San Francisco must pay the surcharge on electric rates recently allowed the Pacific Gas & Electric Company by the Railroad Commission. The commission has refused a request from the United Railroads asking that the commission's order creating the surcharge be modified so as to exclude the transportation company from its terms. The request of the United Railroads was based on a contract for power it has with the Sierra and San Francisco Power Company, which company is now being operated by the Pacific Gas & Electric Company under lease. The United Railroads claimed that to increase this rate would result in unjust discrimination against it. In its denial the commission holds that the claims of the United Railroads were given due consideration and that the surcharge is just and reasonable.

THE PACIFIC SOUTHWEST

SANTA FE, NEW MEX.—All bids on the $148,000 bond issue for water, light and sewer at Clovis have been rejected.

ORANGE, CAL.—A contract has been awarded to the General Electric Company for furnishing a 50-hp. motor for the city water works.

BLYTHE, CAL.—Foundations have been laid for a new building to house the electric plant of the Southern Sierras Company. Two carloads of machinery have arrived.

PHOENIX, ARIZ.—Ford, Morgan and Company have been awarded the contract for the excavation of a 20-mile trench for a wood stave pipe line and also for back filling, at $80,000.

OLINDA, CAL.—The Happy Valley irrigation district has shut down work on the Hoover tunnel. It is announced that this is due to dissatisfaction with the progress being made. This tunnel is to be 6500 feet long and is just about half completed.

TUCSON, ARIZ.—With the local loan of $25,000 and volunteer free assistance of Tucson chapter of the American Association of Engineers, two new wells can be sunk and an ample supply of good water obtained for the city, it has been reported by a special committee of the chapter.

VAN NUYS, CAL.—Chief Engineer Jas. W. Reagan has offered the solution of financing the large reservoir planned for construction in the Pacoima Canyon. Three hundred thousand dollars have been allotted by Los Angeles for building a dam back of San Fernando and state funds will also be given for this purpose.

CASA GRANDE, ARIZ.—That construction of the diversion dam here is in sight is evidenced by the fact that advertisements calling for construction of the dam have appeared in California papers. The dam will be built of reinforced concrete and will be located a few miles northeast of Florence, near Price station and adjacent to the Arizona Eastern railroad tracks.

ALBUQUERQUE, NEW MEX.—Plans for the establishing of a power plant capable of developing 22,000 hp. at Elephant Butte dam are in progress. The approximate cost will be four million dollars and the electric power generated would be used on local electric transmission lines. The Stone and Webster Street Car Company of Boston and El Paso desire to lease the power plant from the Water Users' Association and would supply power to farmers.

LOS ANGELES, CAL.—The Western Electric Corporation will erect the largest service station in the world at 16th and Hope streets. The building is to be of brick, 150 by 155 ft. and two stories high. Construction work has already started. The first floor will be devoted to battery inspection, recharging, and sales room. The second floor will be devoted to the general offices. The ground floor is to be built so as to be entirely enclosed in glass. Work is being rushed on this new building and it is planned to move into the quarters some time early in November.

SAN BERNARDINO, CAL.—To meet the demand for increased electrical energy, the Southern Sierras Power Company has just completed the task of "stepping up" the voltage of its 240-mile line from Inyo county to the city of San Bernardino. The work represents an expenditure of $250,000 and increases the horsepower from 25,000 to approximately 60,000 hp., or 2¼ times. It required a year to make the changes required, and the successful culmination of the enterprise has been most satisfactory to all concerned.

THE INTER-MOUNTAIN DISTRICT

RIRIE, IDA.—The town of Ririe has just celebrated the advent of electricity. The Utah Power & Light Company is now furnishing service to practically all of the business houses and part of the residential district, and more consumers will be added as soon as the necessary wiring is completed.

KIMBERLY, IDA.—An irrigation district is being organized in the Kimberly, Hansen and Murtaugh sections of Twin Falls and Cassia county, to irrigate 45,000 acres of dry lands in what is known as the Hansen-Butte project. It is proposed to put in a pumping plant on the Snake river near Murtaugh and generate electricity sufficient to run the pumps and also have electric power for the tract.

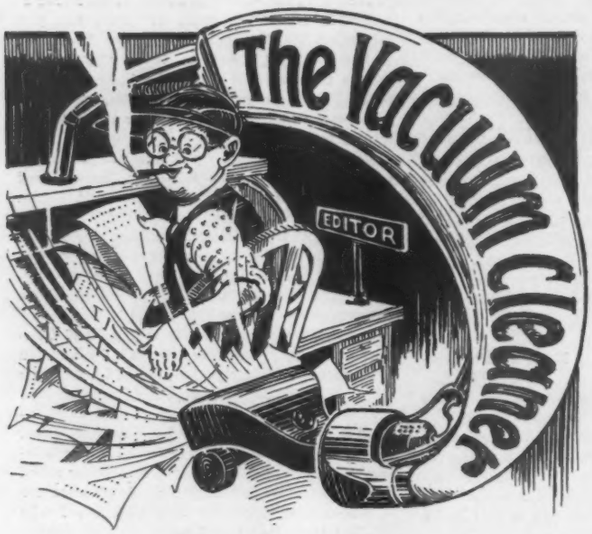
KAMAS, UTAH.—The Kamas-Woodland Telephone Company has asked for an increase in rates on the ground that its present income does not even meet operating expenses by about $200 a month. The company would charge $5.00 instead of $3.50 a month for business telephones, and $3.00 instead of $2.00 for residence telephones outside of Kamas, increases being asked in all other rates, intermediate. Application for increased rates has been filed with the Public Utilities Commission of Utah.

PARIS, IDA.—The Bear Lake Phosphate Company has practically completed the installation of machinery necessary to insure operations on a large scale. They have also built several structures to house equipment. The compressor and motor installation is now complete, and electric power will be available at the mine very soon. The company intends to buy an electric locomotive, which will put the tramming of ore on an efficiency basis. Electricity will be used to light the mine, as well as in other operations where it can be employed to advantage.

BOISE, IDA.—In the dispute between Boise City and the Idaho Power Company in regard to the street lighting and the cancellation of a municipal franchise granted to the Beaver River Power Company, application for a rehearing in the case before the public utilities commission has been made by Boise City. Boise City makes its application on the grounds that it has been denied due process of law, in violation of the Fourteenth Amendment to the Federal Constitution and of section 13 of article 1 of the Constitution, by order No. 672 issued by the commission.

BRIGHAM CITY, UTAH.—The extension of the lighting system the full length of Main Street to conform with the white way in the business district is now being made by the city. The same type of light as in the white way will be used in the new units on North and South Main, but the lights will be suspended over the center of the street at the intersections from a cable supported by poles at the curb on each side of the street, instead of on light standards at the curb line. This new system will cover a distance of ten blocks and will illuminate Main Street from one end to the other, making a handsomely lighted thoroughfare.

SALT LAKE CITY, UTAH.—Owners of land in the southern end of Davis county, known as the Bonneville irrigation district, have voted in favor of bonding their property in the sum of $600,000, for the construction of an irrigation pumping system with the highest lift of irrigation water yet known in Utah. It is planned to build a system which can lift forty cubic feet of water per second out of the Jordan river, and up to a height of 300 feet above the level of the river. The pumping plant, which will be situated about half a mile north of the Davis county line, will take its electric energy from a 44,000-volt line of the Utah Power & Light Company. The present designs of the pumping station call for four motors and four pumps. Two of the motors will be of 900 hp. and two of 500 hp., operating pumps respectively for the 300-ft. and the 150-ft. lift.



The air is a rich source of power, according to a Hamburg scientist, who proposes to obtain a cheap supply of energy from the air by sending up metal balloons to collect electricity. Personally, we never found metal especially buoyant or inclined to blow away, otherwise we might worry about how he was going to get them down again.

* * *

Color, say the psychologists, is a very important factor in life. Somebody else adds that it must be, because it is the cause of race riots, Russia, and pink eye. It also seems to be the cause—or cure—of mosquitoes, according to an account of certain tests made with these sociable little insects:

Experiments have been conducted in a gauze tent, one end of which was formed by large windows. Stone basins were placed for the mosquitoes to breed in. Boxes lined with cloth of various colors were placed upon the floor, and it was noticed that great numbers of mosquitoes entered the box lined with dark blue. Fewer of the insects sought the boxes lined with other colors, the number diminishing in this order: Dark red, brown, scarlet, black, slate gray, olive green,, violet, leaf green, blue, pearl gray, pale green, light blue, ochre, white and orange. No mosquitoes whatever were found in the box lined with yellow.

The moral of this is that wall paper and outing suits should be orange or yellow, with light blue spots introduced for variety.

* * *

The Red Peril, the Yellow Peril and all the other perils have made color quite an obsession with us this time, and having given a good deal of useless information about it we may as well give a useful item, too. The following list was compiled by experts to show the order of legibility for various combinations of colored printing and colored paper — the distance from the eye, the size and form of type and other factors being the same in each case.

1. Black letters on yellow paper.
2. Green letters on white paper.
3. Blue letters on white paper.
4. White letters on blue paper.
5. Black letters on white paper.
6. Yellow letters on black paper.
7. White letters on red paper.
8. White letters on green paper.
9. White letters on black paper.
10. Red letters on yellow paper.

* * *

Railroad electrification reminds us that transportation is not what it used to be. There is a story of a passenger on a southern train who was carried past his destination.

"Heah, conductor!" he shouted, "That was my station, suh! Why didn't you stop theah, suh?"

"We don't stop there no more," said the conductor. "The engineer's mad at the station agent."

And there were some railroads that went in still more for the human touch:

A certain traveler on being asked when purchasing a ticket if he wished to travel first, second, or third-class, was told that there was not much difference except in the fare, and decided to travel third-class. When the train started he noticed that all classes of passengers seemed to be on exactly the same basis and was curious as to what the distinction might be. After several hours of travel the train arrived at the foot of a very long hill and stopped. The conductor came down the line calling:

"First-class passengers stay aboard; second-class passengers get out and walk; third-class passengers get out and push."

* * *

THE ELECTRICAL CONTRACTOR

I've followed this little old 'lectric game
For nigh onto twenty year.
I've had my ups and downs just the same
As you must have had that's here.
I've made some good money and spent some more,
And I've worked with the tools myself,
I've kept my own little retail store
With a nice clean stock on the shelf.
I've figured some jobs by guess and by rule,
I've tried both the old way and new,
I've weighed and measured and guessed like a fool,
And I've counted each socket and screw.
I've allowed for the overhead—heat, light and rent,
Not an item I've missed I'll be bound,
But when Ive collected the very last cent
There's never enough to go 'round.
So I have decided this contracting game
Is not a safe one to be played,
I'll work just as hard and figure the same
But some profit has got to be made.
Hereafter my bid for every blamed one—
I don't care for whom it may be,—
Will be all of my costs for the work when it's done
Plus a nice little profit for me.

And now to you fellows still trying to live
On the profits you never have made,
Just a piece of advice let an old-timer give,
'Cause he's through with the game as it's played.
Quit guessing at prices and labor that's lost
And hoping 'gainst hope you'll pull through;
Take all future jobs on the basis of cost
Plus a nice little profit for you.

S. W. LEAVER.

* * *

Sidelights on the field of journalism are afforded by a recent advertisement in an "Employment Wanted" column, in which a young lady having charge of the "fiction department of the XXX International News Service" desires a position in an advertising department. Of course we learned during the war that a great part of international news came under the head of fiction, but this is the first time we have seen fiction writing proffered as a qualification for advertising work.

* * *

Through irrigation and other methods electricity is still coming to the rescue of dry places. The very dry are promised a bona fide kick from this electrified water.